MDR-42 Ruggedized POI PC Display

User Manual

you + ROTEC

ROTEC technology

Preface

The purpose of this manual is to support the user during the installation, application, and modification of the hardware/software described in the following sections. The processes are explained from various technical aspects to simplify the individual steps.

In case of problems, it is helpful to try to identify the error in a reproducible way, and to compare the settings of all DIP switches, jumpers, and connector pin assignments, as well as all parameter settings (software), etc., with the specifications in this manual, **before** you call us.

The product you purchased is versatile and complex, and even a small oversight can affect overall performance.

Although the information in this document has been carefully reviewed, ROTEC does not warrant it to be free of errors or omissions. In this case, we apologize and would greatly appreciate correction proposals.

ROTEC reserves the right to make any changes to the hardware or software to improve functionality or simply operation. These changes will not be documented in all instances.

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1. Instruction

This manual will familiarize you with the installation and use of your Rotec MDR-/42 display. Please take the time to read these instructions even if you are familiar with monitors and computers.

We have taken all possible care to ensure that this manual contains correct, accurate information. We reserve the right to make changes according to technical progress. However, the manufacturer cannot assume liability for any possible errors. In addition, the manufacturer cannot guarantee that the hardware will meet the purpose you require. We would appreciate reports of any errors, suggestions or criticism.

2. Important Safety Information

This section contains:

- Important safety information
- Battery information

This display has been tested for conformance to safety regulations and requirements, and has been certified for international use. Like any electronic device, however, the display should be used with care. To protect yourself from possible injury and to minimize the risk of damage to the display, read and follow these safety instructions.

General Guidelines

- Read all of these instructions.
- Save these instructions for later use.
- Follow all warnings and instructions marked on the display.
- Except as explained elsewhere in this manual, do not attempt to service the display yourself. Opening or removing covers might expose you to dangerous voltage points or other risks. Refer all servicing in marked compartments to service personnel.
- If for any reason the cabinet cover needs to be removed, then the instructions given in this manual must be closely followed.

Installation Restrictions

- Do not use the opened display near water.
- Do not place the display on an unstable cart, stand, or table. The display might fall and be seriously damaged.
- Do not block or cover the ventilation slots on the cover or cabinet of the display. Air must be allowed to circulate through these slots in order to ensure that the display operates properly and does not overheat.
- Install the display near an electrical outlet for ease of access. Use the plug on the power cord as the power disconnect device for the display. When your display is switched off, be aware that it still carries full line voltage, and consumes some electrical energy. To completely remove all voltages from the display and the auxiliary outlet, you must unplug the power cable from the wall outlet.
- Do not place the display near or over a radiator or heat register or in direct sunlight. Place the display in a small enclosure only if providing proper ventilation.
- To prevent fire, never place any type of candle or flames on the top or near the display.
- Do not permit anything to rest on the power cord. Do not locate the display where people can walk on its power cord.

- Do not plug the display into the same circuit with radio or television receivers.

Electrical Restrictions

- Use the plug that is provided with the display. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
- For international installation with a power source of 88-264 VAC, use a minimum 0.75 mm^2 PVC sheathed three-core flexible cord, type H05VV-F3G, with a green/yellow protective earthing conductor electrically connected to the protective earthing terminal within the equipment and connected to the protective earthing contact of the plug. The cable set should have safety approvals for the international installation and be marked HAR.
- For plugged equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.
- Operate the display from the type of power source indicated on the marking label. If you are unsure of the type of power available, consult your dealer or local power company.
- When your display is switched off, be aware that it still carries full line voltage. To completely remove all voltages from the display, you must unplug the power cable from the wall outlet.

Operating and Maintenance Guidelines

- Keep the area around the display free from static electricity and magnetic fields. Before you touch the display, discharge static electricity on your body by touching a metallic surface.
- Operate the display only when the cover is in the closed position.
- Do not turn the display on and off in rapid succession. Doing so might damage the configuration files and other data on the hard disk.
- Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls might result in damage and often requires extensive work by a qualified technician to restore the product to normal operation.
- Unplug the display and the monitor from the electrical outlet before cleaning. Clean the display and the monitor periodically with a damp cloth.
- Prepare the display before moving it by taking the following actions:
  - Disconnect the display and the monitor from the wall outlet.
  - Close the cabinet.
  - Disconnect external peripheral devices.
- Unplug the display from the wall outlet and refer servicing to qualified service personnel under any of the following conditions:
  - The cord or plug is damaged or frayed.
  - The display does not operate normally when the operating instructions are followed.
  - The display has been dropped or the cabinet has been damaged.
  - The display exhibits a distinct change in performance, indicating a need for service.
- The LCD panel used in this product is made of glass. Therefore, it can break when the product is dropped or applied with impact. Be careful not to be injured by broken glass pieces in case the LCD panel breaks. The LCD panel is a very high technology product giving you fine picture

details. Occasionally, a few non-active pixels may appear on the screen as a fixed point of blue, green or red.

- When the MDR display is operated continuously for long hours, the residual image of a previous image may be observed. If a fixed image is displayed for a long period, this residual image may be observed permanently (image sticking).
  In order to prevent the fast development of image sticking, the following recommendations are suggested:
  - A fixed image should not be displayed for a long period; the image should be changed to other images with short cycles.
  - When the MDR display is not in use, please turn off the display.
  - When the MDR display is in idle, please use moving screen saver.

Battery Information

If the display has a battery that can be changed by the user, observe the following warning whenever you are handling the battery:

Warning!

Danger of explosion if battery is incorrectly replaced. The battery used in this device may present a fire or chemical burn hazard if mistreated.

Do not recharge, disassemble, heat above 100°C (212°F), or incinerate. Do not expose the contents of the battery cells to water.

Replace the battery with an approved battery only. Approved replacement batteries are available from your supplier. Use of another battery may present a risk of fire or explosion.

Dispose of the old battery according to local recycling regulations.

Note:

Do not dispose batteries. Please return batteries to your supplier to ensure recycling and disposal according to the legal regulations.

Note:

The batteries used for timer backup or similar purposes, do not contain cadmium or mercury compounds.

WARNING:
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

THIS SYMBOL INDICATES THAT DANGEROUS VOLTAGE CONSTITUTING A RISK OF ELECTRIC SHOCK IS PRESENT WITHIN THIS UNIT.

THIS SYMBOL INDICATES THAT THERE ARE IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.

3. Unpacking

Carefully take the display out of the packaging and make sure that all of the following components are included:

- Display
- Power plug (optional)
- 1 Keys
- Set of retaining screws/bolts (for hooking the display in the mounting adapter)
- This user manual
- Windows XP licence including CD

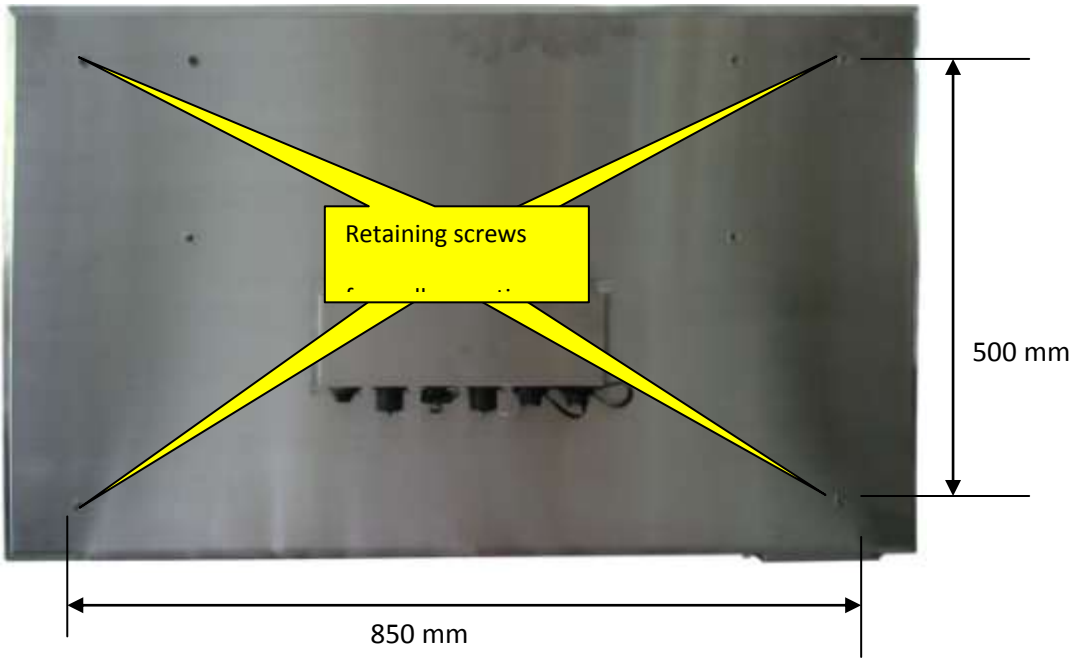
4. Wall mounting

The Rotec MDR display can be mounted and operated in vertical or in horizontal position. That means that the display can hang either in “landscape” or in “portrait” orientation. The displayed picture can also be rotated to fit the desired orientation.

Attention:

For proper function of the display’s cooling system it is necessary that the airflow input with the filtercover is always located on the lower edge of the display. (Landscape operation: Air filter is in the lower left corner. Portrait operation: Air filter is in the lower right corner).

- Mount a mounting adapter to the wall that fits to the mounting holes of the display.



- Mount the four retaining screws to the rear side of the display. The display will always be hooked to the mounting adapter with the four screws.

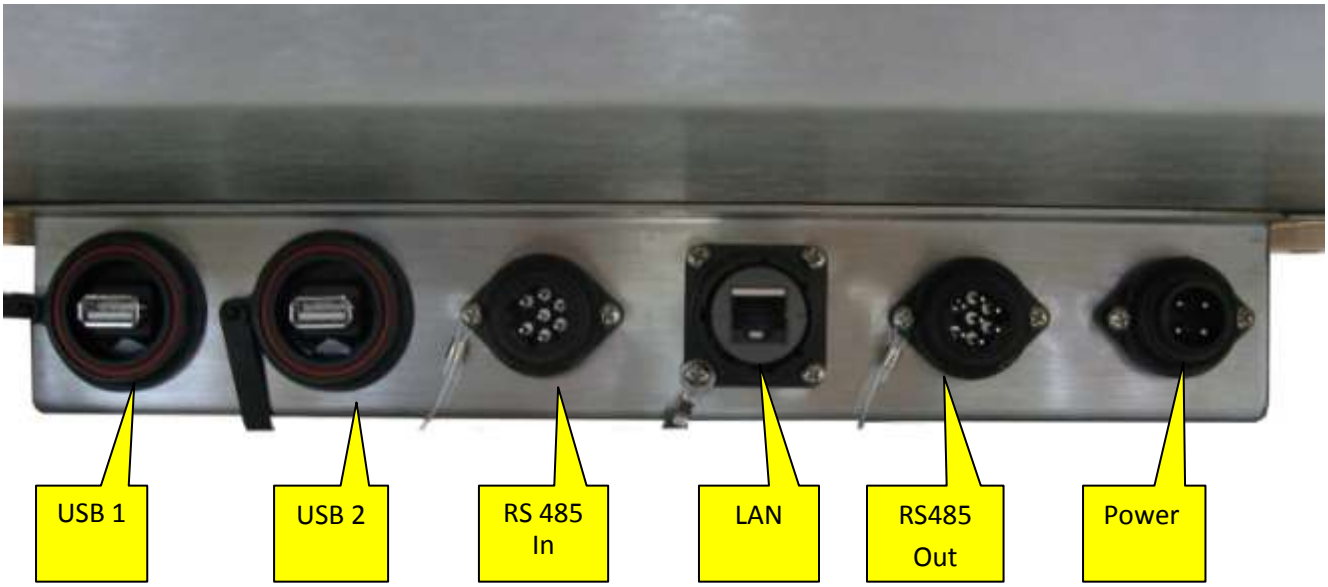
- Hook the retaining screws of the display to the mounting adapter (already mounted to the wall).

5. Connecting

The connectors of the **ROTEC MDR** display are located at the bottum of the switch box on the raer of the display.

To connect the cables to the display, perform the following steps:

- Loosen and remove the covers of the connectors appropriate
- Plug the cable to the appropriate connectors
- Minimum, the power cable needs to be connected
- For PC operation the USB and LAN can be used



5.1. Power Connector

Pin	Description
1	AC L
2	NC
3	AC N
4	Frame Ground

Table 1: Power

5.2. RS 485 In

1	NC
2	Signal transmit
3	Signal receive
4	NC
5	Ground
6	NC
7	NC

Tabel 2: RS485 In

RS485 is an Option.

5.3. RS 485 Out

1	NC
2	Signal receive
3	Signal transmit
4	NC
5	Ground
6	NC
7	NC

Table 3: RS485 Out

5.4. USB 1/2

USB connector Type A

5.5. LAN

Standard pin assignment

6. Open/close the cabinet

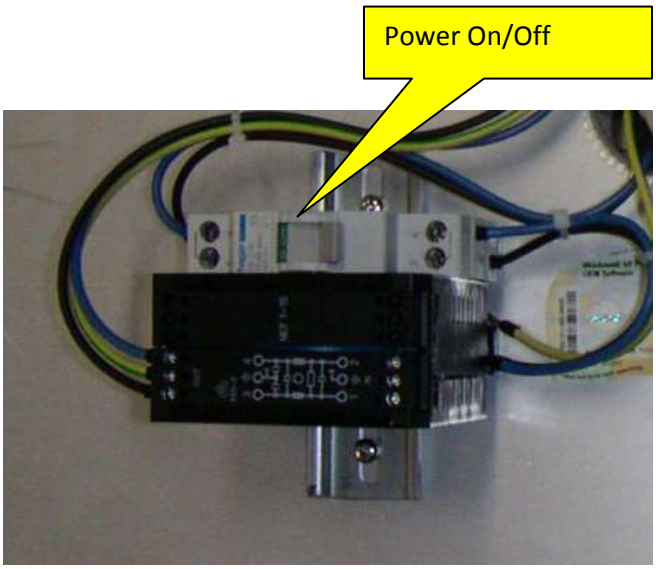
To open the cabinet use the two keys and turn them counter-clockwise. Lift the cover with the display to the end position and then downward until it engage.

To close the cabinet lift the cover to the end position and the downward to the close position. Turn both keys clockwise and put them out.

The keys can only put out when the cabinet is totally closed.

Warning!

Take care that power is off while doing some handlings in the open cabinet. If it is not possible to disconnect the powercord use the power switch inside the cabinet, to switch off the power.



7. Start Up

The **ROTEC MDR** will start up by connecting the power cable to the power connector on the rear side. Take care that the cable is supplied with power.

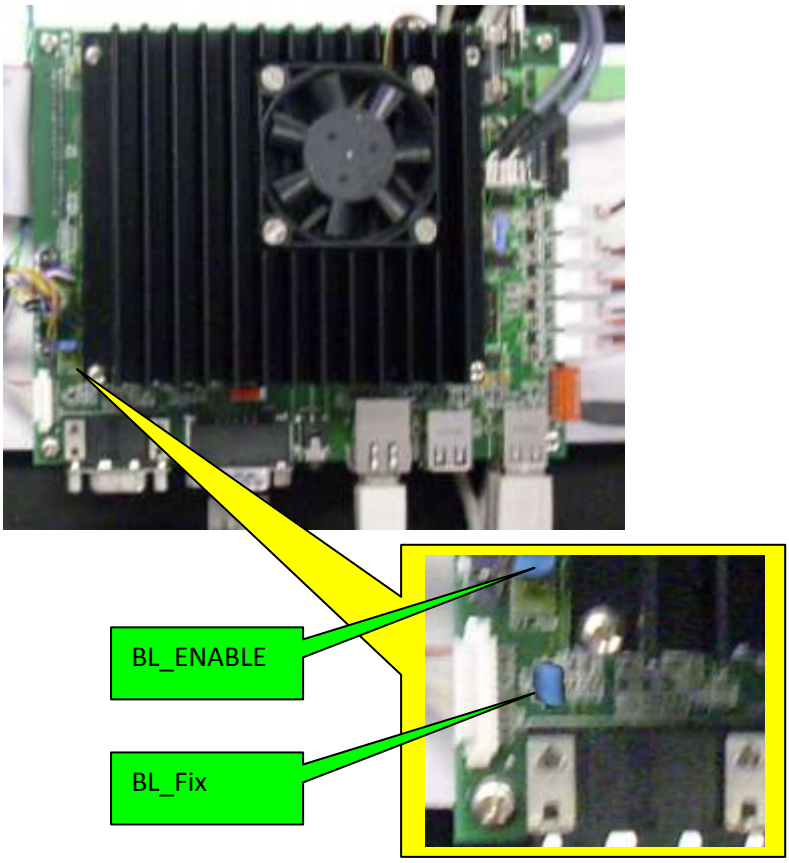
The MDR will boot up the built-in PC.

7.1. Blind Start Up

At factory the display is set to visual start up.
For setting the display to blind start up, open the cabinet and locate the dimming board.

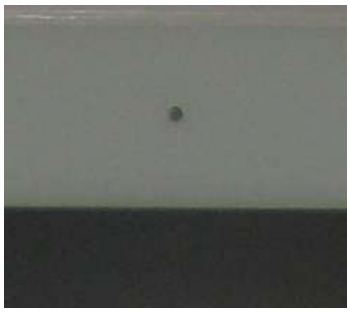
Set the Jumper BL_Enable for Dark Boot.

Set the jumper BL-Fix, the Backlight is always on (only for service an maintance)



7.2. Ambient Light Control

The brightness of the display is controlled with an ambient light sensor, which is behind the little hole in the frontglass at the top. The characteristics can be programmed (Section 11).



7.3. Temperature Managment

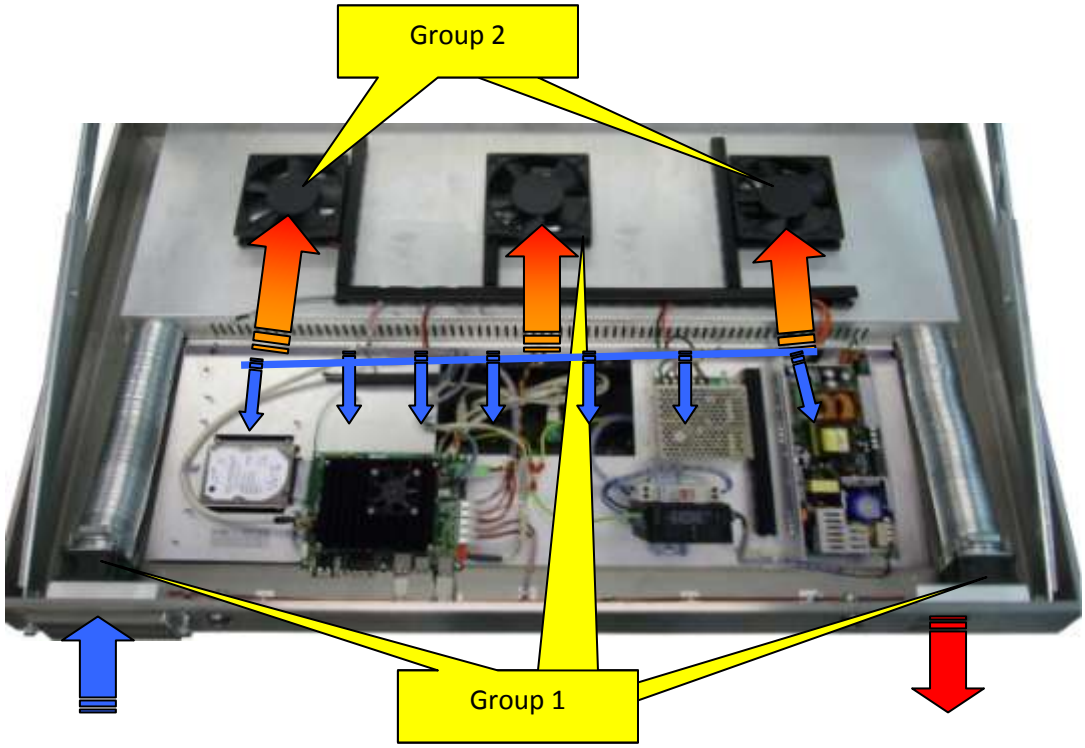
The temperature inside the display is detected with an sensor inside the cabinet, which is located in the dimming board.

The air circulation is divided in two parts, the primary and the secondary circulation. They are totally separated from each other. The temperature from the primary circulation is being transported to the secondary circulation with a heat exchanger.

The fans are arranged in two groups:

Group 1: Two fans for the secondary and the middle fan for the primary circulation.

Group 2: Two fans for the primary circulation.



At factory the temperature limits are set to:

Group 1 on > 35°C

Group 2 on > 45°C

To protect the TFT panel, the backlight will be dimmed to the minimum value at 50°C and shut off at 70°C
The characteristics can be programmed. See section 11.

7.4. Watchdog

After the operating system is started up. the watchdog is activated (refer to Appendix B).

If the watchdog will not retriggered every second, because the Dimming Task is corrupted or the PC stopped, the PC will reset. During the reset the backlight of the display is off only when the display is set to blind start up.

8. Maintenance

Change the filter periodical. The period depend on the ambient conditions. It is recommend to change the filter element each 3 month.

Clear the front glas not with routh material to avoid scrapper.

9. Technical Data

9.1. Summery

Product	**MDR-42**
LCD Module Size	42“
LCD Module Model	42“ CMO V420H1-L07
Visual Characteristics	
Panel Resolution	1920x1080
Display Resolution	1920x1080(native), 1366 x 768, 1360 x 768, 1280 x 768, 1024 x 768, 852 x 480, 800 x 600 without scaling
Response time	Tg = 6,5ms
Contrast ratio	1000:1
Brightness	500 cd/m²
Standard Input/Output Capabilities	
DVI (DVI-D)	No
RGB-HV in	No
Video (S-Video, Composite)	No
Standard PC Input / Output	Yes (Output)
Special Connectors	
Power Connector	Amphenol male Connector
USB	2 x Amphenol male Connector
RS485	2 x Amphenol male Connector
LAN Connector	Amphenol female Connector
Control	
IR Remote	Yes (Option)
On Screen Display (OSD)	No
Manual Controls of OSD (Bottons on back of the monitor)	No
Control over LAN	Yes / Additional Software Required
Controled parameters	
- backlight brightness	Yes
- backlight on/off	Yes
- Fan on/off	Yes
Software upgrade	Yes
Watchdog	Yes
Ambient Light Sensing	Yes
Over Heating Protection	Yes (Option)
Other Specifications	
Protective Glass Cover	Yes, Anti-glare
Embedded PC	Yes
System for 24H/7D usage	Yes
Operating Temperature Range	0 to 50 degree Celsius at 10-90% Hum.
Product Warranty	18 months from the delivery date (Return To Base)

Embedded PC Specification	
CPU Performance	Intel Celeron 800 MHz up to Intel Core2 Duo
Memory	256MB RAM (up to 1 Gbyte optional)
LAN	10/100 Base-T
USB	2x USB 2.0
Serial Ports	1x RS-232
Parallel	1x LPT (Optional)
LVDS	1x LVDS, 2ch, 24 Bit
IDE	2x enhanced IDE-Ports, SATA
Sound Audio	AC' 97
Mass Storage	Hard Disk 40GB (CFC-Card slot, PCMCIA Optional)
Operating System	Windows XP, Linux
Power Supply	
Input Voltage [V]	AC88-264
Input Current [A]	4A/115VAC 2A/230VAC
Input Frequency [Hz]	50/60 (47-63)
Inrush Current [A]	18/115VAC 36/230VAC
Output Voltage [V]	24
Output Current [A]	0-13
Output Wattage [W]	312
Mechanical Specification	
Fan with minimal noise	Yes / PC and entire monitor separately
Security	Yes
Masking of the front glass	Black / White
Housing	Steanless steel natural or with Powder Coating
Size of Monitor (WxHxD)	1045x637x149
Size of Packaging (WxHxD)	1150x770x340
Weight of Monitor with Protection Glass (NET)	65 Kg
Weight including Packaging (Cross)	75 kg
Mounting	
Fixation Points on the back of the monitor	(L) 850 x (H) 500 mm VESA 600x200
Landscape or Portrait mode use	Yes
Classification	
Classification	IP54 Compliant
CE, UL and FCC certified	CE, FCC, prepared for UL

9.2. Blockdiagram

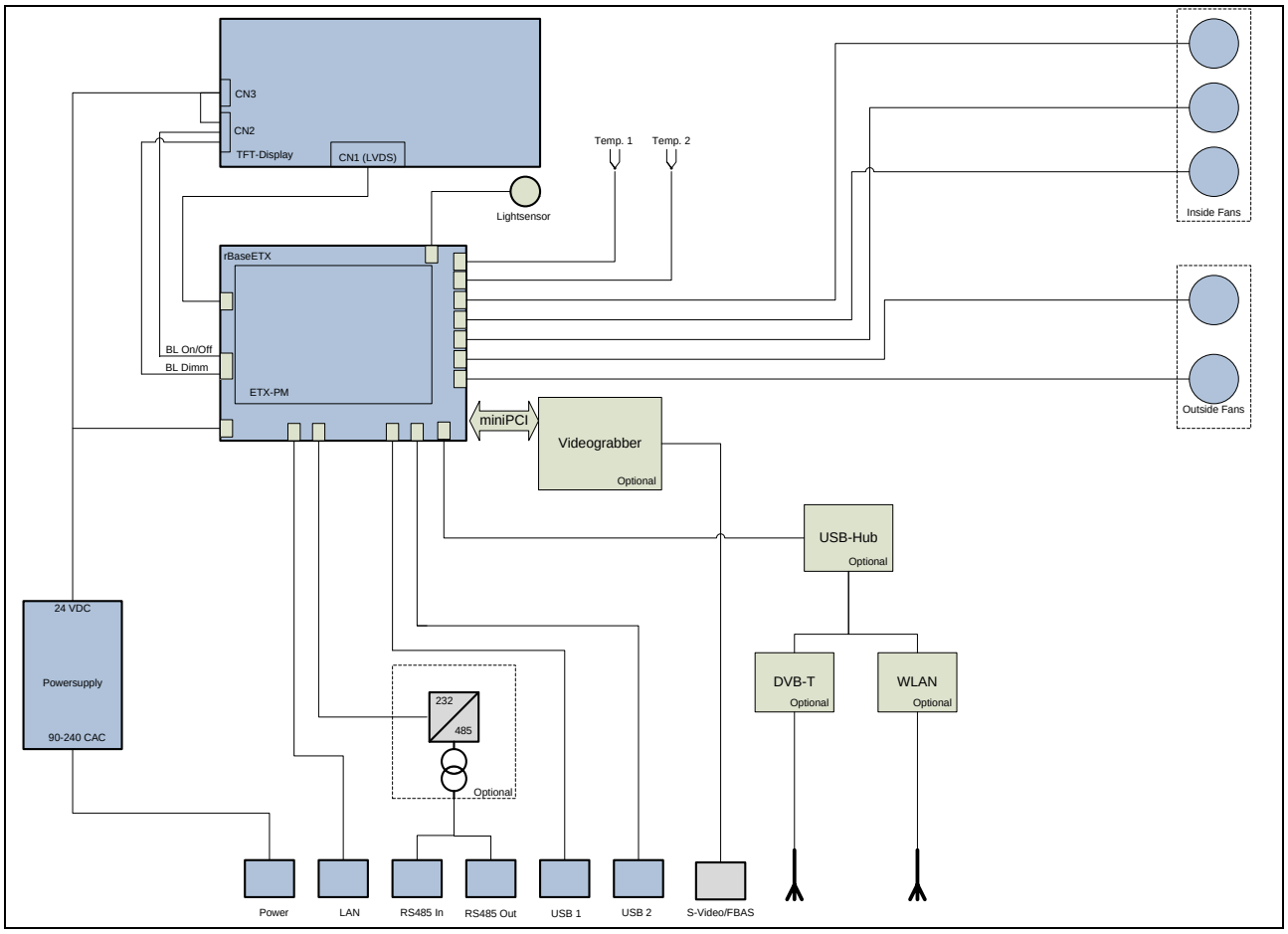
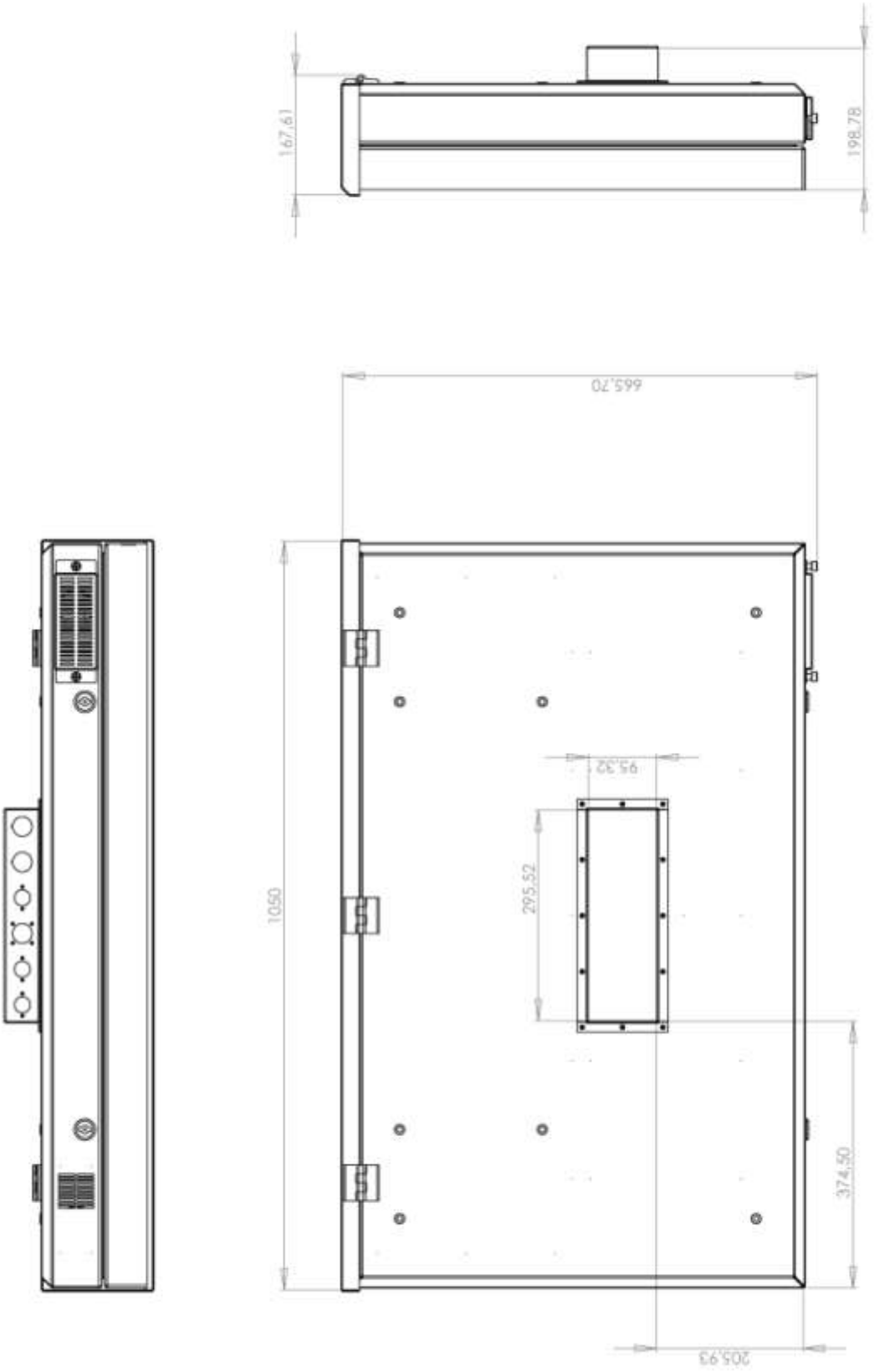


Diagram 1: Schematic of Components

9.3. Mechanical dimensions



PC

9.4. Baseboard

These section give an overview about the features of the baseboard rBaseETX. Details about the interfaces can you found in the next chapters. Some features depend on used ETX module. Graphic controller, ethernet controller, primary and or secondary IDE will be influenced by the ETX module. It's important to read the manual of the ETX module before using it with the rBase.

9.4.1. Power

The rBaseETX has a two pin power socket with a wide input voltage range.
Type of on board connector: PhoenixContact (type: MSTBA 2,5/ 2-G-5,08; order code: 175 72 42).

Type of jacket: PhoenixContact MSTB 2,5/ 2-ST-5,08 (order code: 175 70 19).

The assignemt is shown in the following table.

PIN	Description	Type
1	GND	PWR
2	VCC	IO

Table 4: Power

Take attention to the right polarity of the power supply. Beside the connector a '+' for Vcc and '-' for GND is printed on the board to help for connecting with the right polarity.

The electrical characteristics of the input power supply are shown in the next table:

Parameter	Symbol	Min	Max	Unit
Supply Voltage	VCC	+9	+28	V
Supply Current	ICC		8	A

Table 5: Power consumption

The rBaseETX has internal high efficient switching voltage controllers for generating 12V, 5V and 3.3V. The internal supply current is 4A, 10A or 2A for the 12V, 5V respectively for the 3.3V line. The internal supply current was partly used for the electronics on board. So maximal supply current for external device is listed in the following table.

Parameter	Symbol	Max	Unit
Supply Current at 5V Stby	Icc 5Vstdby	0.5	A
Supply Current at 12V	Icc 12V	2.5	A
Supply Current at 5V	Icc 5V	8.5	A
Supply Current at 3.3V	Icc 3.3V	2	A

Table 6: Onboard supply current

9.4.2. Interfaces

9.4.2.1. VGA interface

PIN	Description	Type
1	Red	Out
2	Green	Out
3	Blue	Out
4	n.c.	-
5	GND	PWR
6	GND	PWR
7	GND	PWR
8	GND	PWR
9	GND	PWR
10	GND	PWR
11	n.c.	-
12	DDC-DATA	IO
13	H-SYNC	OUT
14	V-SYNC	OUT
15	DDC-CLK	OUT

Table 7: VGA Pin assignment

To connect a common VGA monitor rBaseETX board has a 15pin SUB-D high density connector at front side. The graphic resolutions depends on the used ETX boards. Please refer the manual of your ETX board which maximal resolutions are possible.

9.4.2.2. Ethernet

rBaseETX supports a 10-Base-T/100 Base-TX ethernet interfaces. There are two LED for LINK and ACTIVITY. The left green one signals good link and the right yellow one signals the activity by blinking.

9.4.2.3. UART interface COM1

The serial interface COM1 is available as a 9pin SUB-D connector at the front. The pin assignment is according the following table.

PIN	Description	Type
1	DCD	IN
2	RXD	Input
3	TXD	Output
4	DTR	Output
5	GND	GND
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	RING	Input

Table 8: UART1 Pin assignment

9.4.2.4. UART interface COM2

The UART interface COM2 is available through a 10pin IDC connector with 2,54mm pitch. The connector type is from ODU. The pin assignments is made use of flat ribbon cables, see also the following table. The signals have RS232 level.

PIN	Description	Type
1	DCD	IN
2	DSR	IN
3	RXD	IN
4	RTS	OUT
5	TXD	OUT
6	CTS	IN
7	DTR	OUT
8	RING	IN
9	GND	GND
10	NC	n.c.

Table 9: UART1 Pin assignment

9.4.2.5. USB Interface USB1/2 and USB 2/3

The rBaseETX has 4 USB type A interfaces at the connector front side. Each USB port is short circuit protected. Also each USB port is available to deliver up to 500mA current at the +5V line. rBaseETX supports the high-speed mode, but if the maximal bus speed depends on applied ETX module. Refer your ETX module manual for details.

PIN	Description	Type
1	VCC, +5V maximal 500mA	PWR
2	Data-	IO
3	Data+	IO
4	Ground	GND

Table 10: USB Pin assignment

9.4.2.6. Keyboard and Mouse PS/2 interface

To connect a PS/2 keyboard or mouse you may to order an adapter cable at ROTEC. The sockets for keyboard and mouse at the rBaseETX has the following pin assignments.

PIN	Description	Type
1	Keyboard-CLK	OC
2	GND	PWR
3	Vcc 5V	PWR
4	Keyboard-DATA	OC

Table 11: Keyboard Pin assignment

PIN	Description	Type
1	Mouse-CLK	IO
2	VCC +5V	PWR
3	GND	PWR
4	Mouse-DATA	IO

Table 12: Mouse Pin assignment

9.4.2.7. IDE Interface for common 2.5'' hard disks

2.5'' IDE hard disks can driven at the IDE connector. For connecting the hard disk with the rBaseETX use a common 44-pin flat ribbon cable with 1mm pitch.

9.4.2.8. Usage of SATA hard disks

Some ETX modules have a SATA interface to connect SATA hard disks to the ETX modules. To support the usage of SATA hard disks the rBaseETX baseboard has a special power connector for supplying the power to the SATA hard disks. The pin assignment for the HD_PWR connector are shown in next table. Power chords for SATA hard disks can ordered from ROTEC technology.

PIN	Description	Type
1	5V	PWR
2	GND	PWR
3	GND	PWR
4	12V	PWR

Table 13: Connector HD_PWR

9.4.2.9. Compact Flash Card

A commom CF card type I/II can inserted in the rBaseETX board. The CF card is used as IDE interface in true IDE mode and is connected to the primary IDE interface of the mounted ETX module. A slide switch allow to change between MASTER and SLAVE mode.

For pin description please refer the specification “CF+ and CompactFlash specification revision 4.1”.

9.4.2.10. MiniPCI

For extension purposes a MiniPCI card type III can inserted to the rBaseETX board. MiniPCI cards with pure modem functionality and with audio codec AC97 are not supported.

9.4.2.11. General purpose IO GPIO

At the rBaseETX module there are up to 16 general purpose IO's available. They can individually configured as an input or an output. Each configured output can used in push-pull or in open-drain mode. Every input can be configured as trigger source which results finally in an IRQ11 event. All GPIO lines have a 100kOhm pull-down resistor for having a well defined input state when leaving the IO unconnected. Please refer the data sheet of the PCA9535 from NXP about possibilities and restrictions.

PIN	Description	Type
1	VCC 5V	PWR
2	VCC 5V	PWR
3	IO-1-7 and BL_ENABLE if jumper is closed	IN,OUT, OC
4	IO-0-0	IN,OUT, OC
5	IO-1-6	IN,OUT, OC
6	IO-0-1	IN,OUT, OC
7	IO-1-5	IN,OUT, OC
8	IO-0-2	IN,OUT, OC
9	IO-1-4	IN,OUT, OC
10	IO-0-3	IN,OUT, OC
11	IO-1-3	IN,OUT, OC
12	IO-0-4	IN,OUT, OC
13	IO-1-2	IN,OUT, OC
14	IO-0-5	IN,OUT, OC
15	IO-1-1	IN,OUT, OC
16	IO-0-6	IN,OUT, OC
17	IO-1-0	IN,OUT, OC
18	IO-0-7	IN,OUT, OC
19	GND	PWR
20	GND	PWR

Table 14: GPIO Pin assignment

9.4.2.12. FAN1, FAN2, FAN3, FAN4, FAN5

rBaseETX can control up to 5 DC fans. The fans can be controlled individually in speed. It will also be possible to speed up the fans with increasing temperature or vice versa. The control will be done through two ADT7476A devices. These devices allow several settings and features. For a detailed information about all possible settings and readings please refer the data sheet of ADT7474A. The electrical restriction can be found in the following table. According the given values it will be possible to drive 3 fans with a current consumption of 0.5A or to drive 5 fans with a current consumption of 0.3A.

Parameter	Symbol	Type	Unit
Vcc	Supply voltage	12	V
Icc	Supply current FANx	max 0.5	A
Icc_total	Total supply current all FAN's	1.5	A

Table 15: Electrical parameters for FANx

The total current supply Icc_FAN for all FANx connector are restricted to 1.5A.

PIN	Description	Type
1	GND	PWR
2	VCC +12V	PWR
3	Speed signal	IN

Table 16: Fan Pin assignment

9.4.2.13. Temperature Senor

Two additional temperature sensors can connected via the connector T1_SENS and T2_SENS. The ADT7476A controller measures the voltage at the pn exchange of a simple transistor. For detailed information about the possible transistors and how to connect them to the ADT7476A refer the data sheet.

PIN	Description	Type
1	D+	Analog
2	D-	Analog

Table 17: Temp.Sensor Pin assignment

9.4.2.14. LVDS Interface

rBaseETX supports up to 2 channel LVDS interface with 18bit or 24bit color depth. The LCD pannel voltage can be set by placing a jumper between 12V, 5V or 3.3V. A wrong setting of the supply voltage can destroy your connected LCD pannel.

Jumper setting	LCD supply voltage
Pin: 1-2	Vcc: 12V
Pin: 3-4	Vcc: 5V
Pin: 5-6	Vcc: 3.3V

Table 18: Jumpersetting Voltage TFT-TC

Pin	Description	Type
1	GND	PWR
2	CH1-TX0-	LVDS
3	CH1-TX0+	LVDS
4	GND	PWR
5	CH1-TX1-	LVDS
6	CH1-TX1+	LVDS
7	GND	PWR
8	CH1-TX2-	LVDS
9	CH1-TX2+	LVDS
10	GND	PWR
11	CH1-CLK-	LVDS
12	CH1-CLK+	LVDS
13	GND	PWR
14	CH1-TX3-	LVDS
15	CH1-TX3+	LVDS
16	GND	PWR
17	CH2-TX0-	LVDS
18	CH2-TX0+	LVDS
19	GND	PWR
20	CH1-TX1-	LVDS
21	CH1-TX1+	LVDS
22	GND	PWR
23	CH2-TX2-	LVDS
24	CH1-TX2+	LVDS
25	GND	PWR
26	CH2-CLK-	LVDS
27	CH2-CLK+	LVDS
28	GND	PWR
29	CH2-TX3-	LVDS
30	CH2-TX3+	LVDS
31	GND	PWR
32	Contrast	Analog
33	GND	PWR
34	+5V	PWR
35	+5V	PWR
36	+3.3V	PWR
37	+3.3V	PWR
38	Vcc (ref table 18)	PWR
39	Vcc (ref table 18)	PWR
40	Vcc (ref table 18)	PWR
41	Vcc (ref table 18)	PWR

Table 19: LVDS Pin assignment

9.4.2.15. Inverter support INV

A backlight inverter with no heave load can be driven by the rBaseETX board. Via the CHILI interface the dimming voltage vor the backlight inverter can be controlled. The BL_ON signal at the connector is driven from ETX module. The BL_ON signal can be additional controlled by the two jumpers BL_FIX_ON and BL_ENABLE. Please refer for understanding the following state table. With the IO-1-7 line from the GPIO the backlight can be enabled or disabled. This is useful for dark boot phases. In the table X means state don't cares, L means logical low level and H means logical high level. Please remark that the BL_ON_ETX signal which comes directly from ETX board is inverted, e.g. a low level at this line means backlight is on.

BL_ON_ETX	BL_FIX_ON	BL_ENABLE	BL_ENABLE (GPIO)	BL_ON
X	closed	X	X	H
H	open	open	X	L
L	open	open	X	H
X	open	closed	IO-1-7 = L	L
H	open	closed	IO-1-7 = H	L
L	open	closed	IO-1-7 = H	H

Table 20: Function matrix BL_ON

PIN	Description	Type
1	Vcc +12V	PWR
2	Vcc +12V	PWR
3	Vcc +12V	PWR
4	Vcc +12V	PWR
5	BL_ON	OUT
6	Brightness	Analog 0-3.3V
7	GND	PWR
8	GND	PWR
9	GND	PWR
10	GND	PWR

Table 21: Inverter Pin assignment

9.4.2.16. Audio Interface

Common stereo loudspeakers with a minimum impedance of 8Ohm can connected to the rBaseETX board. The audio amplifier has about 5W rms power at each channel. For connecting use a common 3.5mm stereo plug.

9.4.2.17. Feature front connector

For additional purposes a SMB_FRONT connector supports many features. This allows you to design you own pcb board at front side of your device. The connector has the following lines:

PIN	Description	Type
1	GND	PWR
2	IRTX	IO
3	IRRX	IO
4	LED2_STATUS	OUT
5	LED1_STATUS	OUT
6	LIGHT_SENSOR_ANALOG	Analog Input
7	SMB_DATA	IO
8	SMB_CLK	IO
9	n.c.	n.c
10	VCC +5V	PWR

Table 22: Feature connector Pin assignment

LIGHT_SENSOR_ANALOG is a analog input. The input voltage can range between 0V and +5V.

SMB_DATA and SMB_CLK have 5V level signals and are used for optional SMbus devices. SMBus devices can connected to the SMB_DATA and SMB_CLK line.

LED1_SATUS with an 330Ohm series resistor drives a user LED when rBaseETX is running.

LED2_STATUS with an 330Ohm series resistor drives a user LED when rBaseETX is powered but not running.

9.4.2.18. I2C interface (optional)

Optional rBaseETX can ordered with an additional I2C interface for special purposes. The pin assignment of the additional I2C interface is given in the next table.

PIN	Description	Type
1	GND	PWR
2	I2C_DATA	PWR
3	I2C_CLK	PWR
4	+3.3V or +5V (depends on delivered rBaseETX)	PWR

Table 23: I2C_BUS connector

The I2C_DATA and the I2C_CLK line have 10kOhm pull-up resistior to supply voltage either +5V or +3.3V. This interface is useful for adding I2C devices under the control of the ETX module.

9.5. CPU, CHIPSET and SUPER I/O

9.5.1. CPU

The central processing unit(CPU) consists of:

- Mobile Intel® Pentium® M, which includes such features as:
  - Supports Intel® Architecture with Dynamic Execution
  - High performance, low-power core
  - On-die, primary 32-kbyte instruction cache and 32-kbyte write-back data cache
  - On-die, 1-Mbyte second level cache with Advanced Transfer Cache Architecture
  - Advanced Branch Prediction and Data Prefetch Logic
  - Streaming SIMD Extensions 2 (SSE2)
  - 400-MHz, Source-Synchronous processor system bus
  - Advanced Power Management features including Enhanced Intel SpeedStep® technology

9.5.2. Chipset

The chipset consists of:

- Intel® 855GM (north bridge)
- Intel® 82801DB (south bridge

9.5.3. Super I/O

The super I/O device is a Winbond 83627HF

9.6. SYSTEM MEMORY

The *ETX-PM* uses 200-pin DDR Small Outline-Dual Inline Memory Modules (SO-DIMMs). One socket is available for a 2.5-volt, unbuffered PC-1600/2100 DDR-SDRAM with ECC, module of 128, 256, 512MB or 1GB capacity.

9.7. SPECIAL FEATURES

9.7.1. Watchdog Timer

This feature is implemented in the Winbond 83627HF super I/O. You can configure the Watchdog Timer (WDT) in BIOS setup to start after a set amount of time after power-on boot. The application software should strobe the WDT to prevent its timeout. Upon timeout, the WDT resets and restarts the system. This provides a way to recover from program crashes or lockups.

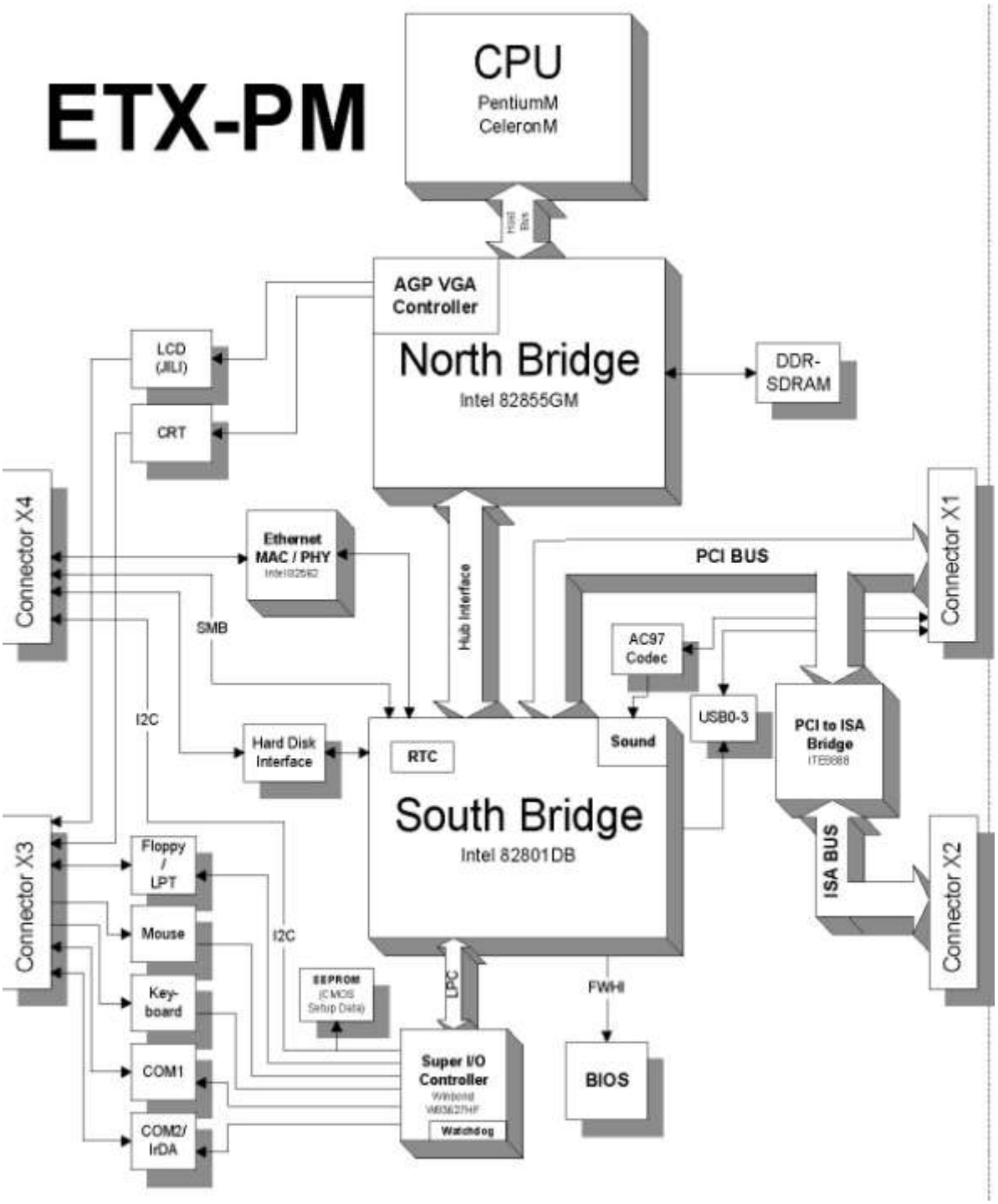
9.7.1.1. Configuration

You can program the timeout period for the watchdog timer in two ranges:

- 1-second increments from 1 to 255 seconds
- 1-minute increments from 1 to 255 minutes

Contact ROTEC technical support for information on programming and operating the WDT.

9.8. BLOCK DIAGRAM



9.9. Processor Performance Control

The Pentium M processor can run in different performance states (multiple frequency/voltage operating points). The CPU performance can be altered while the computer is functioning. This allows the processor to run at different core frequencies and voltages depending on CPU thermal state and OS policy.

Windows XP includes built-in processor performance control to operate the processor more efficiently when it is not fully utilized. Win2k, WinME and Win9x do not support processor performance control. Special software is required for Oses not capable of processor performance control.

In Windows, the processor performance control policy is linked to the Power Scheme setting in the control panel power option applet.

Notes: Windows always runs at the highest performance state when the “Home/Office” or “Always On” power scheme is selected. For a more detailed information about processor performance control, see: Chapter 8 of the ACPI Specification Revision 2.0c available at www.acpi.info Windows platform design note at http://www.microsoft.com/whdc/hwdev/tech/onnow/procperfctrl.mspx

9.10. SYSTEM RESOURCES

9.10.1. Interrupt Request (IRQ) Lines

In 8259 PIC mode

IRQ #	Used For	Available	Comment
0	Timer0	No	
1	Keyboard	No	
2	Slave 8259	No	
3	COM2	No	Note (1)
4	COM1	No	Note (1)
5	LPT2	Yes	Note (2)
6	Floppy Drive Controller	No	Note (1)
7	LPT1	No	Note (1)
8	RTC	No	
9	SCI	No	Note (3)
10	COM3	Yes	Note (2)
11	COM4	Yes	Note (2)
12	PS/2 Mouse	No	Note (1)
13	FPU	No	
14	IDE0	No	Note (1)
15	IDE1	No	Note (1)

Notes: [1] If the “Used For” device is disabled in setup, the corresponding interrupt is available for other devices. [2] Unavailable if baseboard is equipped with an I/O controller SMC FDC37C669, and the device is enabled in setup. [3] Unavailable in Advanced Configuration and Power Interface (ACPI) mode. Used as System Control Interrupt (SCI) in ACPI mode.

In APIC mode:

IRQ #	Used For	Available	Comment
0	Timer0	No	
1	Keyboard	No	
2	Slave 8259	No	
3	COM2	No	Note (1)
4	COM1	No	Note (1)
5	PCI/LPT2	Yes	Note (2)
6	Floppy Drive Controller	No	Note (1)
7	LPT1	No	Note (1)
8	RTC	No	
9	SCI	No	System Control Interrupt (3)
10	COM3	Yes	Note (2)
11	COM4	Yes	Note (2)
12	PS/2 Mouse	No	Note (1)
13	FPU	No	
14	IDE0	No	Note (4)
15	IDE1	No	Note (4)
16	PIRQ[A]	For PCI	PCI IRQ line 1 + USB UCHI controller #1 + Graphics controller
17	PIRQ[B]	For PCI	PCI IRQ line 2 + AC97 Audio controller
18	PIRQ[C]	For PCI	PCI IRQ line 3 + USB UCHI controller #3 + Native IDE
19	PIRQ[D]	For PCI	PCI IRQ line 4 + USB UCHI controller #2
20	PIRQ[E]	No	Lan Controller
21	PIRQ[F]	No	
22	PIRQ[G]	No	
23	PIRQ[H]	No	USB EHCI controller

Notes: [1] If the “Used For” device is disabled in setup, the corresponding interrupt is available for other devices.

[2] Unavailable if baseboard is equipped with an I/O controller SMC FDC37C669, and the device is enabled in

setup.

[3] Unavailable in Advanced Configuration and Power Interface (ACPI) mode. Used as System Control Interrupt (SCI) in ACPI mode.

[4] IRQs are available if IDE controller is either disabled in setup or if in Native IDE mode.

9.10.2. Direct Memory Access (DMA) Channels

DMA #	Used for	Available	Comment
0		Yes	
1		Yes	Unavailable if Sound Blaster is enabled with default configuration.
2	FDC	No	If the “used-for” device is disabled in setup, the corresponding DMA channel is available for other devices.
3	LPT	Yes	Unavailable if LPT is used in ECP mode.
4	Cascade	No	
5		Yes	
6		Yes	
7		Yes	

9.10.3. Memory Area

Upper Memory	Used for	Available	Comment
C0000h – CFFFFh	VGA BIOS	No	
D0000h – DFFFFh		Yes	ISA bus or shadow RAM
E0000h – FFFFFh	System BIOS	No	

9.10.4. I/O Address Map

The I/O-port addresses of the *ETX-PM* are functionally identical with a standard PC/AT. The following I/O ports are used:

I/O Address	Used for	Available	Comment
2E8-2Efh	COM4	No	Available if external I/O controller not used.
370-371h	Configuration space for SMC controller	No	Available if external I/O controller not used.
3E8-3Efh	COM3	No	Available if external I/O controller not used.
1000h >	PCI	No	I/O ports 1000h and above might be allocated by PCI devices or onboard hardware.

9.10.5. Peripheral Component Interconnect (PCI) Devices

PCI Device	Busmaster	PCI Interrupt	Comment
Audio, USB and Ethernet		See IRQ resource tables above	Integrated in the Intel chipset. No REQx/GNTx pair needed.

You can use REQ0/GNT0, REQ1/GNT1, REQ2/GNT2, and REQ3/GNT3 pairs for external PCI devices.

9.10.6. Inter-IC (I^2C) Bus

I2C Address	Used For	Available	Comment
A0h	EEPROM	No	EEPROM for CMOS data.
B0h	Reserved	No	Reserved for internal use.
58h	Reserved	No	Reserved for internal use.

9.10.7. System Management (SM) Bus

You can use the following SM bus addresses for external devices.

SM Bus Address	SM Device	Comment
12h	SMART_CHARGER	Not to be used with any SM bus device except a charger
14h	SMART_SELECTOR	Not to be used with any SM bus device except a selector
16h	SMART_BATTERY	Not to be used with any SM bus device except a battery
D2h	Clock generator	Do not use under any circumstances.

The standard ETX-PM Power management BIOS does not support batteries. If you require further information about this topic, please contact Kontron Embedded Modules Technical Support.

9.11. BIOS OPERATION

The module is equipped with a Phoenix BIOS, which is located in an onboard Flash EEPROM. The device has 8-bit access. Faster access (16 bit) is provided by the shadow RAM feature. You can update the BIOS using a Flash utility.

9.11.1. Setup Guide

The PhoenixBIOS Setup Utility changes system behavior by modifying the BIOS configuration. The setup program uses a number of menus to make changes and turn features on or off.

The BIOS setup menus documented in this section represent those found in most models of the *ETX-PM.* The BIOS Setup for specific models can differ slightly.

Note: Selecting incorrect values may cause system boot failure. Load setup-default values to recover by pressing <F9>. It might also be necessary to use the “reset configuration data” option in the BIOS setup and set it to “yes”. In certain circumstances this may also help to recover from system boot failure or a resource conflict.

9.11.2. Start Phoenix BIOS Setup Utility

To start the PhoenixBIOS setup utility, press <F2> when the following string appears during bootup.

Press <F2> to enter Setup

The Main Menu then appears.

The Setup Screen is composed of several sections:

Setup Screen	Location	Function
Menu Bar	Top	Lists and selects all top level menus.
Legend Bar	Bottom	Lists setup navigation keys.
Item Specific Help Window	Right	Help for selected item.
Menu Window	Left Center	Selection fields for current menu.
General Help Window	Overlay (center)	Help for selected menu.

Menu Bar

The menu bar at the top of the window lists different menus. Use the left/right arrow keys to make a selection.

Legend Bar

Use the keys listed in the legend bar on the bottom to make your selections or exit the current menu. The table below describes the legend keys and their alternates.

Key	Function
<F1> or <Alt-H>	General Help window.
<Esc>	Exit menu.
← or → Arrow key	Select a menu.
↑ or ↓ Arrow key	Select fields in current menu.
<Tab> or <Shift-Tab>	Cycle cursor up and down.
<Home> or <End>	Move cursor to top or bottom of current window.
<PgUp> or <PgDn>	Move cursor to next or previous page.
<F5> or <->	Select previous value for the current field.
<F6> or <+> or <Space>	Select next value for the current field.
<F9>	Load the default configuration values for this menu.
<F10>	Save and exit.
<Enter>	Execute command or select submenu.
<Alt-R>	Refresh screen.

Selecting an Item

Use the ↑ or ↓ key to move the cursor to the field you want. Then use the + and – keys to select a value for that field. The Save Value commands in the Exit menu save the values displayed in all the menus.

Displaying Submenus

Use the ← or → key to move the cursor to the submenu you want. Then press <Enter>. A pointer (□) marks all submenus.

Item Specific Help Window

The Help window on the right side of each menu displays the Help text for the selected item. It updates as you move the cursor to each field.

General Help Window

Pressing <F1> or <ALT-F1> on a menu brings up the General Help window that describes the legend keys and their alternates. Press <Esc> to exit the General Help window.

9.11.3. Main Menu

Feature	Option	Description
System Time	HH:MM:SS	Set system time. Use <Enter to move to MM or SS.
System Date	MM/DD/YYYY	Set system date. Use <Enter to move to DD or YYYY.
Legacy Diskette A	360 kB, 5 ¼ “ 1.2 MB, 5 ¼ “ 720 kB, 3 ½ “ 1.44/1.25 MB, 3 ½ “ 2.88 MB, 3 ½ “ Disabled	Select type of floppy disk drive installed in system.
Legacy Diskette B	See above. Disabled	See above.
_Primary Master	Autodetected drive	Displays result of PM autotyping.
_Primary Slave	Autodetected drive	Displays result of PS autotyping.
_Secondary Master	Autodetected drive	Displays result of SM autotyping.
_Secondary Slave	Autodetected drive	Displays result of SS autotyping.
Smart Device Monitoring	Disabled Enabled	Turns on Self-Monitoring Analysis-Reporting Technology, which monitors the condition of the hard drive and reports when a catastrophic IDE failure is about to happen.

System Memory	N/A	Displays amount of conventional memory detected during bootup.
Extended Memory	N/A	Displays amount of extended memory detected during bootup.

Note: In the Option column, bold shows default settings.

9.11.3.1. Master or Slave Submenus

Feature	Option	Description
Type	None IDE Removable ATAPI Removable CD-ROM Other ATAPI User Auto	None = Autotyping is not able to supply the drive type or end user has selected None, disabling any drive that may be installed. User = End user supplies the hdd information. Auto = Autotyping, the drive itself supplies the information. CD-RO = CD-ROM drive.
Cylinders	1 to 65,536	Number of cylinders.
Heads	1 to 256	Number of read/write heads.
Sectors	1 to 63	Number of sectors per track.
Maximum Capacity	N/A	Displays the calculated size of the drive in CHS
Total Sectors	N/A	Number of total sectors in LBA mode
Maximum Capacity	N/A	Displays the calculated size of the drive in LBA
Multi-Sector Transfer	Disabled Standard 2 sectors 4 sectors 8 sectors 16 sectors	Any selection except Disabled determines the number of sectors transferred per block. Standard is 1 sector per block.
LBA Mode Control	Disabled Enabled	Enabling LBA causes Logical Block Addressing to be used in place of CHS.
32-Bit I/O	Disabled Enabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or Local Bus.
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/ DMA 1 FPIO 4/ DMA 2	Selects the method for transferring the data between the hard disk and system memory.
Ultra DMA Mode	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Selects the UDMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.
SMART Device Monitoring	Disabled Enabled	Shows if SMART Device monitoring is supported by the drive.

9.11.4. Advanced Menu

Feature	Option	Description
_Advanced Chipset Control	sub menu	Opens Advanced Chipset Control sub menu.
_PCI/PNP Configuration	sub menu	Opens PCI/PNP Config sub menu.
_Memory Cache	sub menu	Opens Cache Control sub menu.
_I/O Device Configuration	sub menu	Opens Peripheral Config sub menu.
_Keyboard Features	sub menu	Opens Keyboard Features sub menu.
_Hardware Monitor	sub menu	Shows hardware monitor current state.
_Watchdog Settings	sub menu	Opens Watchdog Config sub menu.
_Display Control	sub menu	Opens Display Control sub menu
_Miscellaneous	sub menu	Opens sub menu with miscellaneous options.

9.11.4.1. Advanced Chipset Control Submenu

Feature	Option	Description
Enable Memory gap	Disabled Enabled	Allows enabling a 1MB memory gap for add-on cards at 15MB
IGD – Device 2	Disabled Enabled	Enable/Disable Internal Graphics Device.
IGD – Device 2, Function 1	Disabled Enabled	Enabled/Disabled Function 1 of the Internal Graphics Device
IGD – Memory Size	1MB, 8MB, 16MB, 32MB UMA	Select the amount of main memory that the Internal Graphics Device will use.

Note: In the Option column, bold shows default settings.

9.11.4.2. PCI/PNP Configuration Submenu

Feature	Option	Description
Plug & Play OS	No Yes	If your system has a PnP OS (e.g. Win9x) select Yes to let the OS configure PnP devices not required for booting. No allows the BIOS to configure them.
Reset Configuration Data*	No Yes	Yes erases all configuration data in ESCD, which stores the configuration settings for plug-in devices. Select Yes when required to restore the manufacturer's defaults.
Secured Setup Configuration	Yes No	Yes prevents a Plug and Play OS from changing system settings.
_PCI Device, Slot #x	sub menu	Opens sub menu to configure slot x PCI device
PCI IRQ line 1 PCI IRQ line 2 PCI IRQ line 3 PCI IRQ line 4 Onboard LAN IRQ line Onboard EHCI IRQ line	Disabled Auto IRQ3, 4, 5, 7, 9, 10, 11, 12, 14,15	Select IRQs for external PIC interrupts A/B/C/D and the onboard LAN and USB2.0 host controller. Select Auto to let the BIOS assign the IRQ.
_PCI/PNP ISA IRQ Resource Exclusion	sub menu	Opens IRQ Exclusion sub menu.
Default Primary Video Adapter	AGP PCI	In a system with an AGP and a PCI video adapter end user can select the adapter which will be initialized by the BIOS.

Note: In the Option column, bold shows default settings.

* Setting this option to "yes", under certain circumstances, may help to recover from system boot failure or a resource conflict.

9.11.4.3. PCI Device, Slot # x Submenu

Feature	Option	Description
Option ROM Scan	Disabled Enabled	Initialize device expansion ROM.
Enable Master	Disabled Enabled	Enables device in slot as a PCI bus master, not every device can function as a master. Check device documentation.
Latency Timer	20h, 40h, 60h, 80h, A0h, C0h, E0h	Minimum guaranteed time slice allocated for bus master in units of PCI bus clocks. A high-priority, high-throughput device may benefit from a greater value.

Note: In the Option column, bold shows default settings.

9.11.4.4. PCI/PNP ISA IRQ Exclusion Submenu

Feature	Option	Description
IRQ3	Available Reserved	Reserves the specified IRQ for use by legacy ISA devices.
IRQ4	see above	see above
IRQ5	see above	see above
IRQ7	see above	see above
IRQ9*	see above	see above
IRQ10	see above	see above
IRQ11	see above	see above
IRQ12	see above	see above
IRQ14	see above	see above (visible only if primary IDE disabled)
IRQ15	see above	see above (visible only if secondary IDE disabled)

Note: In the Option column, bold shows default settings.

* IRQ9 is used for SCI in ACPI mode. Do not use for legacy ISA devices.

9.11.4.5. Memory Cache Submenu

Feature	Option	Description
Memory Cache	Disabled Enabled	Enables or Disables the L2 cache.
Cache System BIOS area	uncached Write Protected	Controls caching of system BIOS area.
Cache Video BIOS area	uncached Write Protected	Controls caching of system BIOS area.
Cache Extended Base / Extended Memory area:	uncached Write Through Write Protected Write Back	Controls caching of system memory below 640k / above 1MB.

D000 – D3FF D400 – D7FF D800 – DBFF DC00 – DFFF	Disabled Write Through Write Protected Write Back	Disabled: block is not cached. Write Through: Writes are cached and sent to main memory at once. Write Protect: Writes are ignored. Write Back: Writes are cached, but not sent to main memory until necessary.

Notes: In the Option column, bold shows default settings.

9.11.4.6. I/O Device Configuration Submenu

Feature	Option	Description
Local Bus IDE adapter	Disabled Primary Secondary Both	Enables onboard PCI IDE device.
Primary IDE UDMA66/100	Enabled Disabled	Disabled limits max. transfer mode to UDMA33. Enabled allows UDMA66 and above.
Secondary IDE UDMA66/100	Enabled Disabled	Disabled limits max. transfer mode to UDMA33. Enabled allows UDMA66 and above.
USB UHCI Host Controller 1	Enabled Disabled	Enable/ Disable UHCI 1 HC = USB ports 0 and 1.
USB UHCI Host Controller 2	Enabled Disabled	Enable/ Disable UHCI 2 HC = USB ports 2 and 3.
USB EHCI Host Controller **	Disabled Enabled	Controls USB 2.0 functionality.**
Legacy USB Support	Disabled Enabled	Enable support for USB keyboard and mice and boot from USB mass storage devices.
AC97 Audio Controller	Disabled Enabled	Enable the AC97 Audio device.
Onboard LAN Controller	Disabled Enabled	Enables the ICH4 internal LAN controller.
Onboard LAN PXE ROM	Disabled Enabled	Enables the remote boot BIOS extension for the onboard LAN controller.
*Onboard FDC	Disabled Enabled	Enables the onboard FDC controller.
Serial port A Serial port B	Disabled Enabled Auto OS Controlled	Disabled turns off the port. Enabled requires end user to enter the base I/O address and the IRQ. Auto makes the BIOS configure the port. OS Controlled lets the PnP OS configure the port after bootup.

Mode	Normal, IrDA	Set the mode for serial port B.
Base I/O address	3F8h, 2F8h, 3E8h, 2E8h	Select I/O base of port.
IRQ (port A and B)	IRQ 3, IRQ 4	Select IRQ of port A and B
*Onboard LPT	Disabled Enabled Auto	Disabled turns off the port. Enabled requires end user to enter the base I/O address and the IRQ. Auto makes the BIOS configure the port.
*Mode	Output only Bi-directional EPP ECP	Set the mode for the parallel port.
*Base I/O address	378h, 278h, 3BCh	Select I/O base of port.
*IRQ	IRQ 5, IRQ 7	Select IRQ of parallel port.
*DMA	DMA1, DMA3	Select DMA channel of port if in ECP mode.

Notes: In the Option column, bold shows default settings. The FDC and LPT settings marked with an asterisk () are mutually exclusive. The FDC or the LPT settings are visible, depending on a configuration resistor on the OEM backplane. If FDC is selected, the FDC signals are available at the LPT port (external floppy). Only Drive B (MOD1/DRV1) is supported, but the drives are internally swapped to let the drive appear as Drive A. **The USB ports are multiplexed between UHCI and EHCI. Ports are routed to EHCI if an USB 2.0 high-speed device is connected and an EHCI driver is loaded. If you want to use the USB boot feature, enable USB BIOS Legacy Support.

9.11.4.7. Keyboard Features Submenu

Feature	Option	Description
Numlock	Auto On Off	On or Off turns NumLock on or off at bootup. Auto turns NumLock on if it finds a numeric key pad.
Key Click	Disabled Enabled	Turns audible key click on.
Keyboard auto-repeat rate	30/sec, 26.7/sec, 21.8/sec, 13.3/sec, 10/sec, 6/sec, 2/sec	Sets number of times to repeat a keystroke per second if you hold the key down.
Keyboard auto-repeat delay	¼ sec, ½ sec, ¾ sec, 1 sec	Sets delay time after the key is held down before it begins to repeat the keystroke.

Note: In the Option column, bold shows default settings.

9.11.4.8. Hardware Monitor Submenu

This submenu shows the current voltages and temperatures of the system.

Vcc (3.3)	3.3V power plane
CPU core	Core voltage (depends on CPU)
5Vsb	5V Standby plane
V(5)	5V power plane
Battery	Backup battery voltage
CPU Temp	Temperature of CPU die

9.11.4.9. Watchdog Settings Submenu

Feature	Option	Description
Mode	Disabled Reset	Select watchdog operation mode.
Delay	1s, 5s, 10s, 30s, 1min, 5min, 10min, 30min	The time until the watchdog counter starts counting. Useful to handle longer boot times.
Timeout	0.4s, 1s, 5s, 10s, 30s, 1min, 5min, 10min	Maximum trigger period.

Note: In the Option column, bold shows default settings.

9.11.4.10. Display Control Submenu

Feature	Option	Description
Display Mode	CRT only LCD only CRT+LCD	Select the display mode.
JDA Revision	1.0	Displays the revision of the JILI data area image.
Flat Panel Type	VGA SVGA XGA XGA2 UXGA Enter PAID Enter FPID Auto	Select Auto to let the BIOS automatically detect the panel type or use one of the predefined fixed panel types. Choose Enter PAID or Enter FPID to manually set JILI3 ID values.
PAID/FPID[1]	0 – FFFF, default 0	Enter the JILI3 ID.
Flat Panel Scaling	Centered Stretched	Stretched expands a low resolution video mode to full screen on a higher flat panel resolution.
Flat Panel Backlight[2]	0 – 255, default 128	Enter a value to adjust backlight of the LCD.
Flat Panel Contrast [3]	0 – 63, default 32	Enter a value to adjust contrast of the LCD.

Notes: [1] Only available if Flat Panel Type (Enter PAID) or (Enter FPID) are selected. [2] Only available if the DAC (MAX5362) is on the OEM backplane or the panel adapter. [3] Only available if the digitally controlled potentiometer (Xicor X9429) is on the OEM backplane or the panel adapter

9.11.4.11. Miscellaneous Submenu

Feature	Option	Description
Floppy Check	Disabled Enabled	Enabled verifies floppy type on boot; disabled speeds boot.
Summary Screen	Disabled Enabled	If enabled, a summary screen is displayed just before booting the OS to let the end user see the system configuration.
QuickBoot Mode	Disabled Enabled	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Extended Memory Testing	Normal Just zero it None	Determines which type of tests will be performed on memory above 1MB. The option Normal is not visible if QuickBoot is enabled.
Dark Boot	Disabled Enabled	If enabled, system comes up with a blank screen instead of the diagnostic screen during bootup.
Halt On Errors	Yes No	Determines if post errors cause the system to halt.
PS/2 Mouse	Autodetect Enabled Disabled	Selecting Disabled prevents any installed PS/2 mouse form functioning, but frees up IRQ12. Selecting Autodetect frees IRQ12 if no mouse was detected.
Large Disk Access Mode	DOS Other	Select DOS if you have DOS. Select Other if you have another OS such as UNIX. A large disk is one that has more than 1024 cylinders, more than 16 heads or more than 63 sectors per track.

9.11.5. Security Menu

Feature	Option	Description
Set User Password	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. In related systems, this password gives restricted access to setup.
Set Supervisor Password	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. In related systems, this password gives full access to setup.
Password on boot	Disabled Enabled	Enabled requires a password on boot. Requires prior setting of the supervisor password. If supervisor password is set and this option is disabled, BIOS assumes user is booting.
Diskette access	User Supervisor	Enabled requires supervisor password to access floppy disk.
Fixed disk boot sector	Normal Write protected	Write protect the boot sector on the hard disk for virus protection. Requires a password to format or Fdisk the hard disk.
Virus check reminder System backup reminder	Disabled Daily Weekly Monthly	Displays a message during bootup asking (Y/N) if you backed up the system or scanned for viruses. Message returns on each boot until you respond with „Y“. Daily displays the message on the first boot of the day, Weekly on the first boot after Sunday, and Monthly on the first boot of the month.

Notes: In the Option column, bold shows default settings. Enabling Supervisor Password requires a password for entering Setup. Passwords are not case sensitive. User and Supervisor passwords are related. A User password is possible only if a Supervisor password exists.

9.11.6. Power Menu

A power management system reduces the amount of energy used after specified periods of inactivity. The setup menu supports:

- Full On state
- Standby state with partial power reduction
- Suspend state with full power reduction Use the Advanced Options menu to specify whether an activity can terminate a Standby or Suspend state and restore Full On.

Feature	Option	Description
*Enable ACPI	No Yes	*Enables/Disables ACPI BIOS (Advanced Configuration and Power Interface). IRQ9 is used for SCI (System Control Interrupt). Do not use for ISA bus devices.
ACPI Control	sub menu	Opens the ACPI sub menu
**Max CPU frequency	***1600MHz 1400MHz 1200MHz 1000MHz 800MHz 600MHz	Warning! Selecting frequencies higher then the default may cause the system to reach “critical trip point” and shutdown if a proper cooling solution is not used. Always ensure that you use proper cooling when selecting higher frequency settings.
****Automatic Thermal Monitor Control Circuit	Disabled TM1 TM2	Enables the thermal control circuit (TCC) of the thermal monitor feature of the Pentium-M CPU. TM1 = 50% duty cycle TM2 = Geyserville III Automatic TTC must be enabled to ensure that the processor operates within specification.
Power Savings	Disabled Customized Maximum Power Saving Maximum Performance	Maximum options select predefined values. Select Customized to make your own selections from the following fields. Disabled turns off all power management.
Standby Timeout	Off, 1min, 2min, 4min, 8min	Inactivity period required to put system in Standby mode (partial power shutdown).
Auto Suspend Timeout	Off, 5min, 10min, 15min, 20min, 30min, 40min, 60min	Inactivity period required after Standby to Suspend mode (maximum power shutdown).
Hard Disk Timeout	Disabled, 10 sec – 15 min	Inactivity period of hard disk required before standby (motor off).
Video Timeout	Disabled, 10 sec – 15 min	Inactivity period of user input device before the screen is turned off.
Resume on Modem Ring	Off On	Enabled wakes the system on incoming calls detected by mode (RI).
Resume on Time	Off On	Enabled wakes the system at a specific time.
Resume Time	00:00:00	Specifies the time when the system is to wake.

Feature	Option	Description
Power Button Function	Power Off Sleep	Determines if the system enters suspend or soft off when the power button is pressed.
Power Loss Control	Stay Off Power On Last State	Determines how the system behaves after a power failure. This only works in conjunction with a CMOS backup battery.

Notes: In the Option column, bold indicates default setting.

* The ISA bus is only available on Prev: x12 or later

* See section 13 of this user's guide for more details about ACPI.
** This option is only available when the module is equipped with BIOS version MODBx14.wph or later.
***The CPU frequency values shown in this example are taken from the ETX-PM 1.6GHz. The default CPU frequency for the ETX-PM 1.6GHz is 1200MHz. Please note that other ETX-PM variants capable of CPU frequency switching may have different possible values listed as well as different defaults.
**** The ETX-PM Celeron M default setting for this value is TM1 (BIOS version MODBR115.wph and later) because the ETX-PM Celeron M does not support TM2.

9.11.6.1. ACPI Control Submenu

Feature	Option	Description
Active Trip Point	Disabled 40 C – 100 C	Determines the temperature of the ACPI Active Trip Point, the point at which the OS will turn on/off the CPU fan.
Passive Trip Point	Disabled 40 C – 100 C	Determines the temperature of the ACPI Passive Trip Point, the point at which the OS will turn on/off CPU clock throttling.
Passive TC1 Value	1, 2, 3, …15, 16	Determines the TC1 (temperature coefficient 1) value for the ACPI passive cooling formula. See section 13.6 for more details.
Passive TC2 Value	1, 2, 3, 4, 5, …15, 16	Determines the TC2 (temperature coefficient 2) value for the ACPI passive cooling formula. See section 13.6 for more details.
Passive TSP Value	2, 4, 6, 8, 10, … 28, 30	Determines the Tsp (sampling period) value for the ACPI passive cooling formula. See chapter 13.6 below for more details.
Critical Trip Point	40 C – 110 C	This value controls the temperature of the ACPI Critical Trip Point- the point at which the OS will shut the system off.
APIC – IO APIC Mode	Disabled Enabled	This item is valid only for Windows XP. Also, a fresh install of the OS must occur when APIC Mode is desired Test the IO APIC by setting an item to Enabled. The APIC Table will then be pointed to by the RSDT, the Local APIC will be initialized, and the proper enable bits will be set in IHC4M. See section 14.1
Native IDE Support	Disabled Enabled	Enable Native IDE support for WINXP by setting this item. The NATA Package will be created if this item is set to Enabled. Changing this item will have no effect in WIN98, WINME, or WIN2K. See section 13.2 for more details.

9.11.6.2. ACPI Resume Events

ETX-PM supports S1 state only, no S3 (S2R) and S4 (S2D). The following events resume the system from S1:

- Power button
- PME#
- PS/2 keyboard and mouse
- USB keyboard and mouse activity
- USB resume event

9.11.7. Boot Menu

9.11.7.1. MultiBoot

Multiboot allows you to select the following boot devices: h Hard disk h Floppy disk h CD-ROM h Network card

You can make the selections from Setup, or by selecting the boot device in the BootFirst Menu.

Note: ETX-PM also supports booting from USB floppy and Mass Storage Device (MSD).

MultiBoot consists of the 2 menus: h Setup Boot Menu h Boot First Menu

9.11.7.2. The Setup Boot Menu

This menu allows selecting the order of the devices from which the BIOS attempts to boot the OS. During POST, if BIOS is unsuccessful at booting from one device, it will try the next one on the list.

The Boot Menu shows two lists, the boot priority list and the exclude from boot order list. The sample below shows the default configuration.

Boot Priority order:	Item Specific Help
1. IDE0: <primary master device> 2. IDE1: <primary slave device> 3. IDE2: <secondary master device> 4. IDE3: <secondary slave device> 5. IDE CD: <IDE CD-ROM> 6. USB Key: <USB stick> 7. USB CDROM: <USB CD-ROM device> 8.	Keys used to view or configure devices: Up and Down arrows select a device. <+> and <-> moves the device up or down. <f> and <r> specifies the device fixed or removable. <x> exclude or include the device to boot. <Shift + 1> enables or disables a device. <1 – 4> Loads default boot sequence.

Exclude from boot order: USB FDC: <USB Floppy drive> USB HDD: <USB Hard Drive device> USB ZIP: <USB ZIP drive> USB LS-120: <USB CDROM device> PCI BEV: <PCI LAN device> PCI SCSI: <PCI SCSI device> Bootable Add-in Cards	

Notes: The standard 1.44MB floppy drive is referenced as Legacy Floppy Drives.

The BIOS only tries to boot from the devices (max 8) in the Boot Priority Order list.

The above menu is only available on ETX-PM modules that have BIOS version MODBr111.wph or later.

9.11.7.3. Boot First Menu

Display the Boot First Menu by pressing <Esc> during POST. In response, the BIOS displays the message Entering Boot Menu and then displays the Boot Menu at the end of POST. Use the menu to select one of the following options:

- Override the existing boot sequence (for this boot only) by selecting another boot device. If the specified device does not load the OS, the BIOS reverts to the previous boot sequence.
- Enter Setup.
- Press <Esc> to continue with the existing boot sequence.

9.11.8. Exit Menu

The following sections describe the five options in Exit Menu. Pressing <Esc> does not exit this menu. You must select an item from the menu to exit.

Exit Saving Changes

Saves all selections and exits setup. Upon reboot, the BIOS configure the system according to the setup selection stored in CMOS.

Exit Discarding Changes

Use this option to exit Setup without storing new selections in CMOS. Previous selections remain in effect.

Load Setup Defaults

Select to display the default values for all Setup menus.

Discard Changes

Discards changes made during a Setup session and revert to values previously saved in CMOS.

Save Changes

Saves all selections without exiting Setup.

9.11.9. Updating or Restoring BIOS

Phoenix Phlash16 allows you to update or restore the BIOS with a newer version or restore a corrupt BIOS by using a floppy disk without having to install a new ROM chip.

1) Get the Phoenix Phlash16 compressed file, CRDxMODB.ZIP, from the Kontron Embedded Modules. It contains the following files:

File	Purpose
MAKEBOOT.EXE	Creates the custom boot sector on the Crisis Recovery Diskette.
CRISBOOT.BIN	Serves as the Crisis Recovery boot sector code.
MINIDOS.SYS	Allows the system to boot in Crisis Recovery Mode.
PHLASH16.EXE	Programs the Flash ROM.
WINCRISIS.EXE	Creates the Crisis Recovery Diskette from Windows.
WINCRISIS.HLP	Serves as the help file of WINCRISES.EXE.
BIOS.WHP	Serves as the actual BIOS image to be programmed into Flash ROM.

BIOS.WPH is a file that contains the 1MB BIOS binary and flash interface code required by Phlash16.EXE

2) To install Phoenix Phlash16 on a hard disk, unzip the content of CRDxMODB.ZIP into a local directory such as C:\PHLASH.

Note: Crisis Recovery requires either a floppy disk connected to the LPT interface (external floppy drive_1) or an USB floppy drive.

3) To create a Crisis Recovery Diskette, insert a blank diskette into Drive A: or B: and execute WINCRISIS.EXE. This copies four files onto the Crisis Recovery Diskette.

File	Purpose
MINIDOS.SYS	Allows the system to boot in Crisis Recovery Mode.
PHLASH16.EXE	Programs the Flash ROM.

BIOS.WPH	Serves as the BIOS image to be programmed into Flash ROM.

4) If the BIOS image (BIOS.WPH) changes because of an update or bug fix, copy the new BIOS.WPH image onto the diskette.

5) Phoenix Phlash16 runs in one of two modes: Command Line or Crisis Recovery. Use the Command Line mode to update or replace a BIOS. To execute Phlash16 in this mode, move to the Crisis Recovery Disk and type PHLASH16. Phoenix Phlash16 will update the BIOS. Phlash16 can fail if the system uses memory managers. If this occurs, the utility displays the following message:
Cannot flash when memory managers are present.

   If you see this message after you execute Phlash16, disable the memory manager or use parameter /x for Phlash16.exe.

9.11.10. Preventing Problems When Updating or Restoring BIOS

Updating the BIOS represents a potential hazard. Power failures or fluctuations that may occur during updating the Flash ROM can damage the BIOS code, making the system unbootable.

To prevent this potential hazard, many systems come with a boot-block Flash ROM. The boot-block region contains a fail-safe recovery routine. If the boot-block code finds a corrupted BIOS (checksum fails), it boots into the crisis recovery mode and loads a BIOS image from a crisis diskette (see above).

Additionally, the end user can insert an update key into the serial port (COM1 only) to force initiating the recovery routine for the boot block.

10. Dimming Control

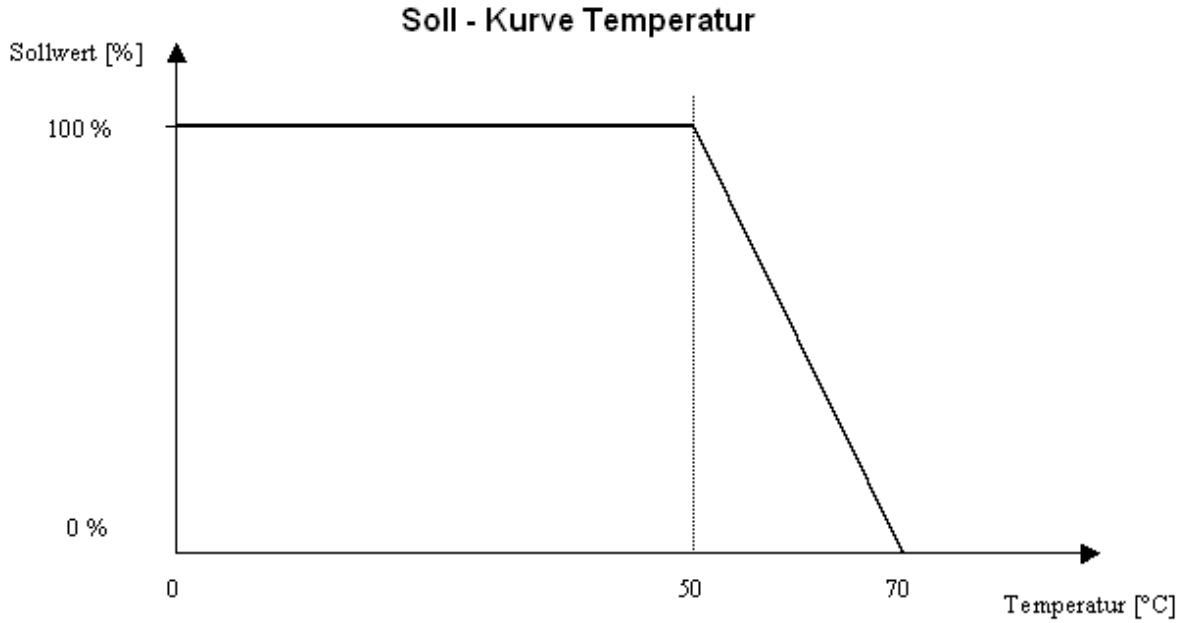
10.1. General Description

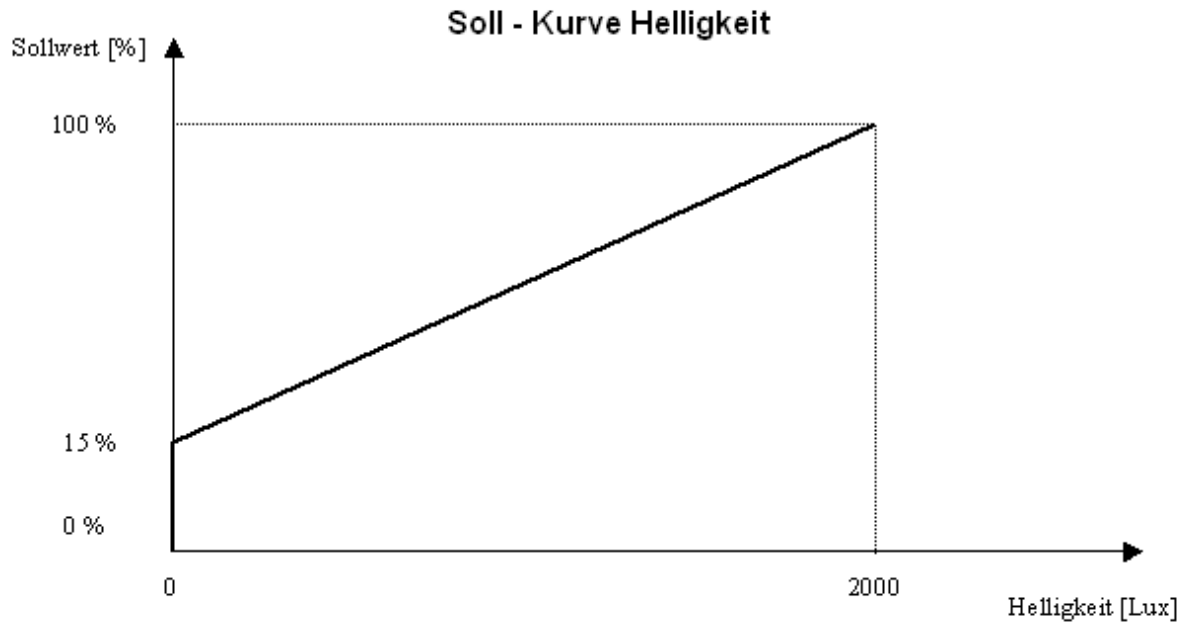
- the tool „Dimming Control“ has the purpose to controll the backlight of TFT displays.
- The backlight can be switched on/off
- the brightness of the backlight is controlled with ambient light sensor and an temperature sensor of the cabinet of the monitor.
- The temperatur managment is able to control two fan groups according to the cabinet temperature inside.
- Aall parameters are programmable with an .ini file.
- Communication to an application with message queues

10.2. Target value backlight brigthness

The brightness of the backlight is determined on the following factors :

- Target backlight [%] = minimum value of temperature and ambient light
- The target value for brightness is the cross value of tempearature and ambient light table





10.3. Installation

The Programm „dimming.exe“ runs under Windows 2000/XP.
For install copy the „dimming.zip“ to the target folder and unzip it.
Then run the „install.bat“.
Note : For autostart of dimming control the entries in Autostart necessary.

10.4. Start

To start dimming.exe use the command

dimmingtray –pathini=[Pfad Inidatei]

example:

dimmingtray.exe –pathini=C:\dimming

The started programm is visible in the traybar as tray-icon.

Symbol :

By clicking the tray-icon with the right mouse button, the following dialogue appears :

The follow selections are possible :

- About Dimming Control : Indicate the Dimming Version
- Dimming Show : Get the Dimming Control window into the foreground
- Dimming Hide : Get the Dimming Control window hide
- Dimming Gui : Get the Gui for Dimming Control
- Exit : Terminate the Program Dimming Control

10.5. Supervision

10.5.1. Watchdog

- The dimming controll can be supervised with an hardware watchdog.
- To activate the watchdog set the according parameter in „dimming.ini“.
- Additional the supervising intervall can be adjust in the „dimming.ini“

Example: activate the watchdog with 60 seconds

```
//--- Watchdog aktiv ( 1=aktiv / 0=inaktiv )  ---
[WDAKT]
Count=1
Val=1
//--- TimeOut Watchdog ( sec )  ---
[WDTIMEOUT]
Count=1
Val=60,0
```

10.5.2. Heartbeat

- The dimming controll is able to supervise an application software with an heartbeat mechanism .
- active the heartbeat supervisor with an entry in „dimming.ini“.
- additional the supervise time is adjustable in the INI-file.
- The heartbeat mechanism can be deactivate with an message from the application(WM_HEARDBEATOFF) .
- The mechanism starts after reveiving the first heartbeat.
- When the supervice time exceeds the first time, an soft reboot is startet.
- If it is not possible to perform an soft reboot then an hard reset is performed.

Example: activate the heartbeat with 20 seconds supervise time

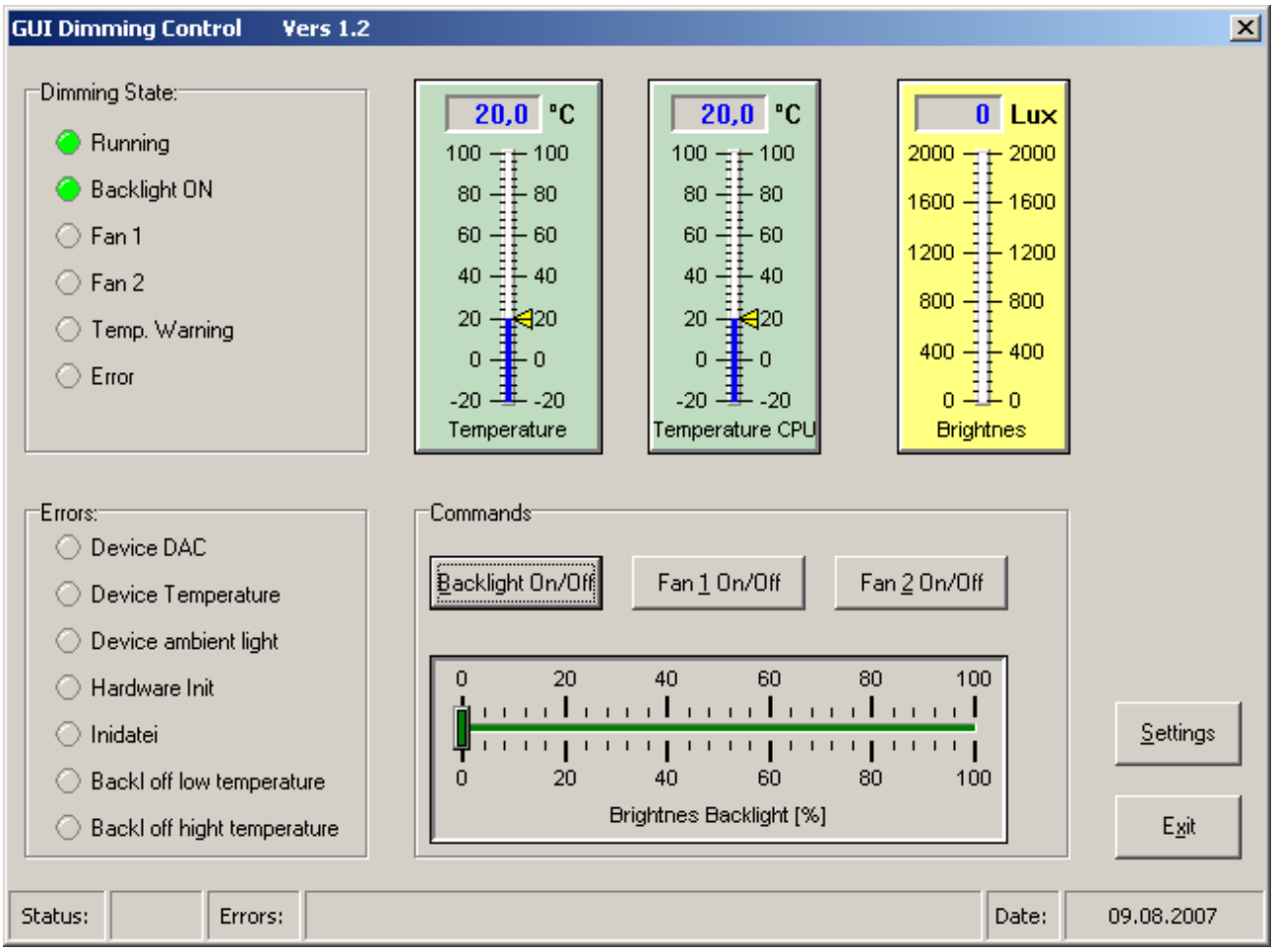
```
//--- Ueberwachung externe Anwendung aktiv ( 1=aktiv / 0=inaktiv )  ---
[HOSTUEBAKT]
Count=1
Val=1
```

```
//--- Timeout zur Ueberwachung einer externen Anwendung (sec)  ---
[HOSTTIMEOUT]
Count=1
Val=20,0
```

10.6. GUI Dimming Control

By means of the tool " GUI Dimming Control " the Dimming Control can parametrize.
Conditions and actual values are displayed.
Furthermore there exists the possibility to execute diagnoses.

10.6.1. Startpage



On this page conditions and actual values are displayed.

In the field **Commands** the following actions can take place to the diagnosis

- Backlight switch On / Off
- Fan 1 switch On / Off
- Fan 2 switch On / Off
- Brightnes adjusting

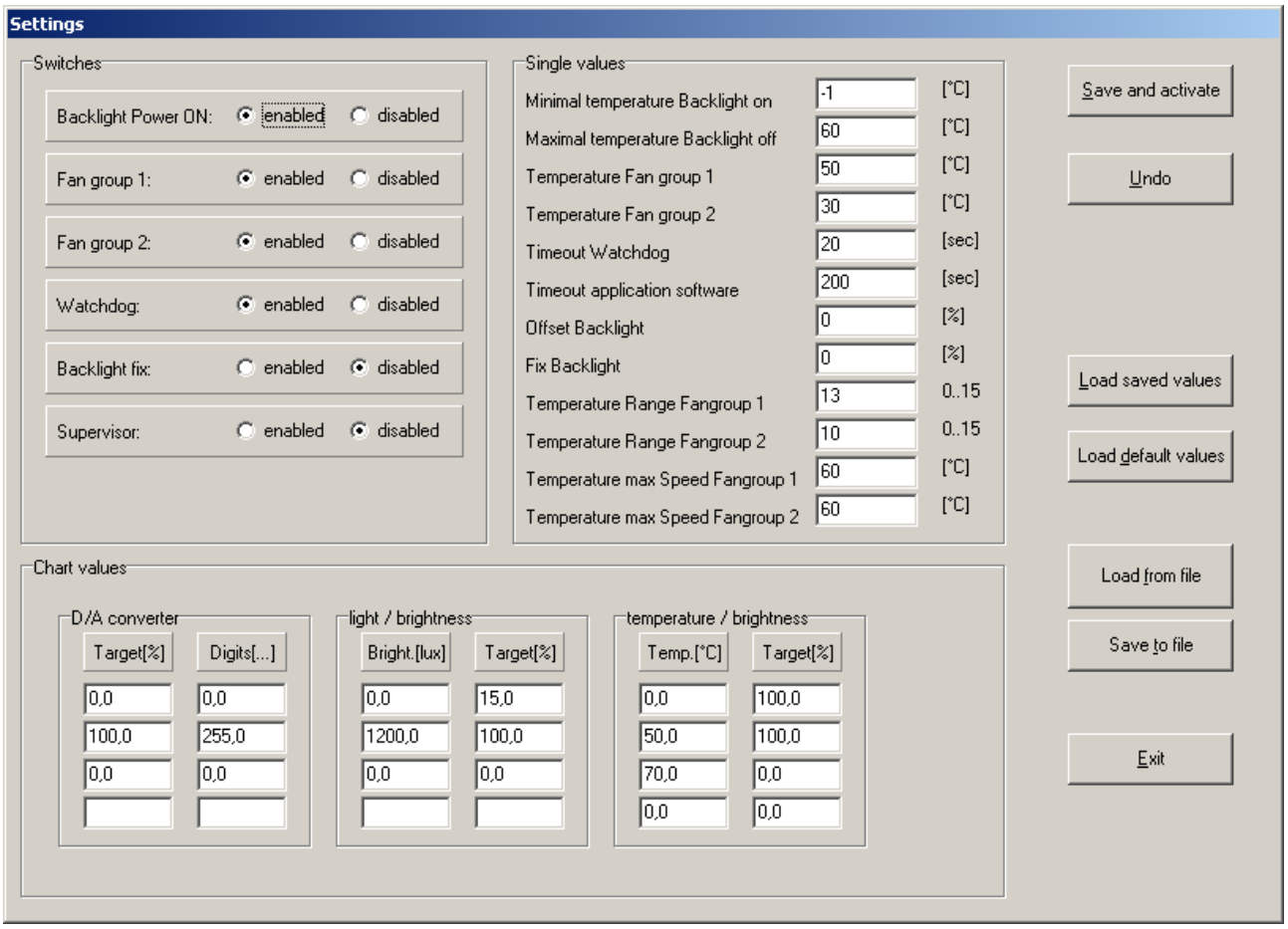
Note:

After an action in the field **Commands** the adjust condition approx. 5 minutes remains.

With the button "**Settings**" the page „**Settings**“ can be selected.

The button **"Exit**" close of the tool.

10.7. Settings



Switches :

- **Backlight Power ON :**
  This value determine if the backlight is switched on automaticaly after programm start of dimming control or the backlight will be switched on by the application via an message
- **Fan group 1 :**
  For activate the fan group 1
- **Fan group 2 :**
  For activate the fan group 2
- **Watchdog :**
  Activate the watchdog
- **Backlight fix :**
  Activate the mode for fixed value backlight brightnes.
  Backlight dimming is inactiv.
- **Supervisior :**
  An application software can supervised with the dimming control.

Single values :

- Minimal temperature Backlight on :

The backlight will not switch on of the actual temperature is under this minimal temperature. The backlight will not switch off when the actual temperature become lower then the minimal value during operation.

- Maximal temperature Backlight off :

The backlight is switched of when the temperature comes higher then the maximum temperature.

- Temperature Fan group 1 :

The fan group 1 is switch on when the actual temperature is higher then defined

- Temperature Fan group 2 :

The fan group 2 is switch on when the actual temperature is higher then defined

- Timeout Watchdog :

Intervall time of watchdog. The CPU will be reset if the watchdog will not triggered from Dimming Control

- Timeout Aplication Software :

This parameter defines the the intervall time the application software has to send an heartbeat (WM_HEARTBEAT).

- Offset Backlight :

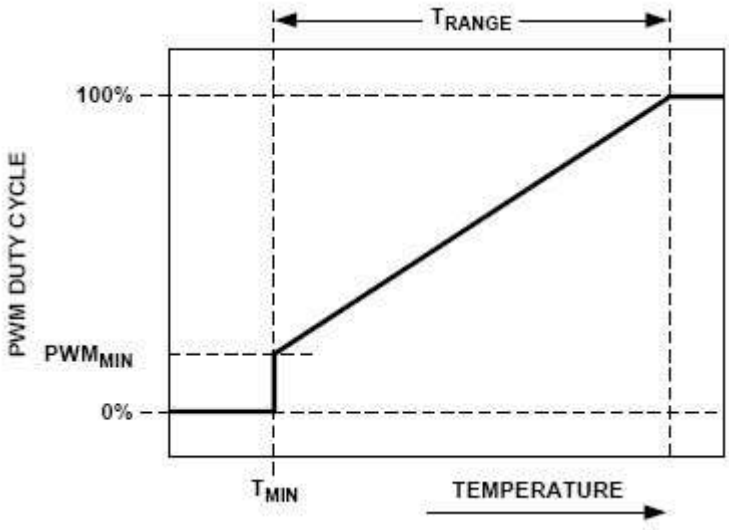
Offset for backlight – brightnes (0 … 100 %)

- Fix Backlight :

Value for backlight if backlight fix ist active (0 … 100 %)

- Temperature Range Fangroup 1 / 2 (0 … 15) :

Temperature T_{Range} for 100 % Fanspeed



- **T_{Range} Values / Temperature (°C)**

Range	°C
0	2
1	2,5
2	3,3
3	4
4	5
5	6,6
6	8
7	10
8	13,3
9	16
10	20
11	26,6
12	32
13	40
14	53,3
15	80

- Temperature max Speed Fangroup 1 / 2 :

Temperature Value for 100 % Fanspeed

If the temperature greater this value, the fan speeds up to 100 %.

Chart values :

- D/A converter

This characteristic adjust the output voltage of the DA converter for the backlight inverter.
Input = Sollwert [%] / output = Digits DA converter

- Light / brightnes

This caracteristic adjust the value for brightness of backlight depending on the ambient light sensor
Input = ambient light [Lux] / output = value brightness %

- Temperature / brightnes

This caracteristic adjust the value for brightness of backlight depending on the temperature sensor in the cabinet
Input = temperature [°C] / output = value brightness %

Buttons :

- **Save an activate**

  Save and activate the input parameter

- **Undo**

  Load the parameters which were active by the start Gui Dimming

- **Load saved values**

  Load last saving values

- **Load default values**

  Load default values

- **Load from file**

  Load values from a file

- **Save to file**

  Save values to a file

- **Exit**

  Exit this page

10.8. Parameter file

The parameter file for Dimming Control is „dimming.ini“

All necessary definations for Dimming Control are in this INI-file.

Structure of an defination : a. [x] *x:=Section*
b. Count=x *x:=number of entries*
c. Val=x *x:=Werte*

10.8.1. Characteristic actual temperatue value

This characteristic adjust the the actual temperature value

Input is the value of the analogic input in digits
Output is the according temperature in °C

Curve:

```
[TEMPERATUR]                Input                Output
Count=8
Val=-110,0;-55,0            // Device value = -110,0 / Temperature = -55,0 Grd Celsius
Val=-50,0;-25,0
Val=-1,0;-0,5
Val=0,0;0,0
Val=1,0;0,5
Val=50,0;25,0
Val=250,0;125,0
Val=0,0;0,0
```

10.8.2. Characteristic DA-converter

This characteristic adjust the output voltage of the DA converter for the backlight inverter.

Input = Sollwert [%] / output = Digits DA converter

Curve :

```
[DAWANDLER]                 Input                output
Count=3
Val=0,0;31,0                // Setpoint = 0,0 % / Digits for DA converter = 31,0
Val=100,0;0,0
Val=0,0;0,0
```

10.8.3. Characteristic ambient light / brightness backlight

This caracteristic adjust the value for brightness of backlight depending on the ambient light sensor

Input = ambient light [Lux] / output = value brightness %

Curve:

```
[LUXSOLLPROZENT]            Input                Output
Count=3
Val=0,0;15,0                // Brightnes = 0,0 Lux / Setpoint = 15,0 %
Val=1950,0;100,0
Val=0,0;0,0
```

10.8.4. Characteristic temperature / brightness backlight

This caracteristic adjust the value for brightness of backlight depending on the temperature sensor in the cabinet

Input = temperature [°C] / output = value brightness %

Curve:

```
[TEMPSOLLPROZENT]                Input                Output
Count=4
Val=0,0;100,0                    // 0,0 Grd Celsius / Setpoint = 100,0 %
Val=50,0;100,0
Val=70,0;0,0
Val=0,0;0,0
```

10.8.5. Backlight power on

This value determine if the backlight is switched on automaticaly after programm start of dimming control ort he backlight will be switched on by the application via an message (WM_BACKLON).

0 = the backlight stay off until the message „WM_BACKLON“ is send.

1 = the backlight is switched on after programm start of dimming control

Definition:

```
[GRUNDZUSBL]
Count=1
Val=1
```

10.8.6. Minimal temperature

The backlight will not switch on of the actual temperature is under this minimal temperature. The backlight will not switch off when the actual temperature drops under then the minimal value during operation.

Definition:

```
[MINTEMPBLON]
Count=1
Val=-1,0
```

10.8.7. Maximum temperature

The backlight is switched of when the temperature comes higher then the maximum temperature.

Definition:

```
[MAXTEMPBLON]
Count=1
Val=70,0
```

10.8.8. Fan group 1

For activate the fan group 1

0 = fan group 1 not activ

1 = fan group 1 activ

Definition:

```
[FAN1AKT]
Count=1
Val=1
```

10.8.9. Fan group 2

For activate the fan group 2

0 = fan group 2 not activ

1 = fan group 2 activ

Definition:

```
[FAN2AKT]
Count=1
Val=1
```

10.8.10. Temperature fan group 1

The fan group 1 is switch on when the actual temperature is higher then defined

Definition:

```
[TEMPFAN1ON]
Count=1
Val=30,0
```

10.8.11. Temperature fan group 2

The fan group 2 is switch on when the actual temperature is higher then defined

Definition:

```
[TEMPFAN2ON]
Count=1
Val=30,0
```

10.8.12. Supervisor for application software

An application software can supervised with the dimming control.

0 = supervisor not activ

1 = supervisor activ

Definition:

```
[HOSTUEBAKT]
Count=1
Val=0
```

10.8.13. Timeout for application software heartbeat

This parameter defines the the intervall time the application software has to send an heartbeat (WM_HEARTBEAT).

Definition:

```
[HOSTTIMEOUT]
Count=1
Val=20,0
```

10.8.14. Watchdog activ

Activate the watchdog

0 = Watchdog not active

1 = Watchdog activ

Definition:

```
[WDAKT]
Count=1
Val=0
```

10.8.15. Timeout watchdog

Intervall time of watchdog. The CPU will be reset if the watchdog will not triggered from Dimming Control

Definition:

```
Count=1
Val=180,0
```

10.8.16. Offset Backlight

Offset for backlight – brightnes (0 … 100 %)

Definition:

```
[BACKLOFFSET]
Count=1
Val=0,0
```

10.8.17. Backlight fix activ

Activate the mode for fixed value backlight brightnes.

Backlight dimming is inactiv.

0 = Backlight fix not active

1 = Backlight fix activ

Definition:

```
[BACKLFIX]
Count=1
Val=0
```

10.8.18. Value for backlight fix

Value for backlight if backlight fix ist active (0 … 100 %)

Definition:

```
[BACKLVALFIX]
Count=1
Val=50,0
```

10.8.19. Debug-Mode

Print of general values on the console.

0 = no print / 1 = print

Notice: not possible under Windows (Linux only)

10.8.20. Debug-Mode SM-Bus

Print of SM-Bus value on the console.

0 = no print / 1 = print

Notice: not possible under Windows (Linux only)

10.8.21. Host name

The host name of the application software for exchange of messages

Definition:

[Hostname]
Text=testprogramm

10.9. Messages

The Dimming Control communicate with the application software with Windows-Messages of the class *CWnd*.

The name of the application software has to set in the section [Hostname] of INI-file *dimming.ini*.

10.9.1. Messages - Commands

10.9.1.1. Application → Dimming Control

Message	Description
WM_BACKLON	Switch on backlight
WM_BACKLOFF	switch off backlight
WM_FAN1ON	Switch on Fangroup 1
WM_FAN1OFF	Switch off Fangroup 1
WM_FAN2ON	Switch on Fangroup 2
WM_FAN2OFF	Switch off Fangroup 2
WM_WDOGTINI	Activate supervisor for application software
WM_WDOGTMAX	Set watchdog to max. timeout (4 minutes); for service only
WM_HEARTBEAT	Heartbeat for supervisor application software
WM_HEARTBEATOFF	Deactivate supervisor application software
WM_INIDATNEU	Take over dimming.ini parameter after changing from application software
WM_DIMMINGON	Activate backlight dimming
WM_DIMMINGOFF	Deactivate backlight dimming
WM_BRIGHTMAX	Set backlight brigthness to maximum value
WM_BRIGHTMIN	Set backligh brightness to minimum value
WM_BRIGHT	Set backlight brigthness to value 0… 100 % (wParam = value)
WM_ANFSYSZUS	Inquire system status
WM_ANFTEMPBRIGHT	Inquire temperature and ambient light
WM_ANFTEMPCPU	Inquire temperature CPU

10.9.1.2. Dimming Control → Application

Message	Description
WM_SYSZUS	System state (wParam = state) / (lParam = Errors)
WM_TEMPBRIGHT	Temperaure and Brightnes wParam = Temperature [Grad Celsius] lParam = Brightnes [Lux]
WM_TEMPCPU	Temperature CPU wParam = Temperature CPU [Grad Celsius]

10.9.1.3. System state

wParam

Bit	Bedeutung
0	1 = Dimming Control is running
1	1 = error
2	1 = Backlight is on
3	1 = Fan group 1 is on
4	1 = Fan group 2 is on
5	1 = Warning Temperature to hight
6	
7	
8	Watchdog is enabled
9	Supervisior for application software is enabled
10	Fangroup 1 is enabled
11	Fangroup 2 is enabled
12	Backlight fix is enabled

lParam

Bit	Bedeutung
0	1 = error device ADC
1	1 = error device temperature
2	1 = error device ambient light
3	1 = error hardware initialization
4	1 = error reading hostname in „dimming.ini“
19	1 = backlight off because of low temperature
20	1 = backlight off because of high temperature

Note : after system status is changed from dimming control by itself the message „WM_SYSZUS“ is send automatically.

10.9.1.4. Sample sending commands

command : **WM_BACKLON**

Headerfile: commands.h

1. Registration of the Windows message

   sDimMessages.WM_BACKLON = RegisterWindowMessage(KENN_STRG_WM_BACKLIGHT_ON);

2. get handle from application software

   hSendTo = FindWindow(NULL, Hostname)

3. send message

   SendMessage(hSendTo, sDimMessages.WM_BACKLON, 0, 0);

Communications Regulations Information

DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and EN 45014

Manufactturer's Name: ROTEC technology GmbH

Manufacturer's Adress: Gutenbergstr. 15
D76437 Rastatt
Germany

Declares, that the product:

Product Name: MDR-42

Conforms to the following Product Specifications:

Safety: IEC 60950-1:2001

EN60950-1:2001

EMC: EN 55022:1998+A1:2000+A2.2003 Class B

EN 55024:1998+A1:2001+A2:2003

EN 61000-3-2:2000
FCC Part 15-Class B/ICES-003, Issue 4

Supplemental Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EC and carries the CE-marking accordingly. The product is tested in a typical configuration.

This device complies with Part 15 of teh FCC Rules. Operation is subject of teh following two Conditions: (1) this device may not cause harmful interferences, and (2) this device must accept